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Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An illustrated monthly journal published in the interests of the science
and the art of pharmacy and the allied branches
of medical and sanitary sciences.

EDITED BY

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VOL. XIV.

MILWAUKEE.
Pharmaceutical Review Publishing Company.
1896.

4752
11-11

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NOTICE TO BINDER: The pages of the supplement for April, May, June and July should be repaged: April, pp. 1—4; May, pp. 5—8; June, pp. 9—12; July, pp. 13—16.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 1. **JANUARY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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WITH the beginning of this year and of the 14th volume, the journal heretofore known as the **Pharmaceutische Rundschau** assumes the title of the **Pharmaceutical Review.** In consideration of some other changes incidental thereto we deem it expedient to offer the following remarks.

Under the able editorship and management of Dr. FREDERICK HOFFMANN, the **Pharmaceutical Review** during the past thirteen years of its existence has acquired an enviable and leading position among the pharmaceutical journals of this country and of Europe. Whereas most American pharmaceutical journals have become the organs of commercial houses, the instruments of advertising agencies, or exponents of special colleges of pharmacy, the **Pharmaceutical Review** in the consideration of all matters of professional, educational, and trade interest has always maintained an uncompromising independence. This prerogative, together with masterly literary attainments, and the sound knowledge and judgment which can only be acquired by long experience in professional life, have combined to give the editorials and all other contributions from the pen of Dr. HOFFMANN particular value and force. It is thus that this journal has also attained the reputation, both at home and abroad, of being fearless in the expression of its opinions, and true to the principles upon which it was established.

The fact that the greater part of the **Review** has been printed in the German language has given rise to numerous and constantly increasing requests to extend the usefulness and influence of the same by printing it in the English language. This request is to be granted with the beginning of this year, but not to the extent of the total exclusion of the German. Such articles from German contributors as would suffer by translation will hereafter, as in the past, be published in German, or in both English and German; but the main part of the journal will be printed in the English language. This change in the character of the **Review** we believe will prove in every respect advantageous, for most, if not all, its German readers in this country are as conversant with the English as with their own language, and the same is almost equally true of its many subscribers and readers in continental Europe.

The greatest change which the **Pharmaceutical Review** is about to experience consists in the partial retirement of its distinguished founder and editor, Dr. HOFFMANN. The fact, however, that his name still appears foremost on the title page, clearly shows that his interest in the journal by no means ceases with his retirement from the more active duties of its management. The names of the co-laborers not only demonstrate that the **Review** has gained a wide circle of friends, but will also serve to remove any suspicion that a partial change of editorship may be attended by any loss of independence or general breadth of character. The national character and the high standard which the **Review** has acquired under the able management of Dr. HOFFMANN, are to be maintained at all hazards; sectionalism and partisanship are to be equally avoided.

Pharmaceutical Review Publishing Company, Milwaukee, Wis.

Original contributions, books for review, exchange journals and all other editorial matters should be addressed to DR. EDWARD KREMERS, MADISON, WIS.
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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 1. **JANUARY, 1896.**

SUBCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

Dr. Hoffmann and the Pharmaceutische Rundschau.

ONE of the most interesting problems which presents itself to the historical student of our profession is to ascertain the influence European countries have had upon the development of pharmacy in this country. The student of the history of civilization likes to dwell upon the benefit derived from close contact between nations. Whether conqueror or conquered the superior nation will give its impress to the type of civilization that follows.

The United States furnish a most interesting field for study in this direction. The interest that attaches to the conquest of the Indian, whether the barbarian of the north or the semi-civilized inhabitant of Mexico and Peru; or to the fight for supremacy on the northern half of this continent between the Spanish, French, Dutch and English in the first centuries of American history, is insignificant to that which is manifested in the amalgamation of nations and the possible characteristics of the ultimate American. The battles fought in the earlier period of our history were largely of arrows and fire-arms, of powder and more powder. The battles that are oft-times, but more silently fought today between the various nationalities are of a different order. Armies of immigrants have invaded this country at its many open ports. The Dutch of New York, the early Germans of Pennsylvania, the French of the northwestern frontier, have disappeared as such. Their names have oft-times been modified to such an extent that one may not even suspect the "foreign" blood. Surely the Herkomers of the Mohawk Valley and the Moravians of Pennsylvania, though deprived of their German names, have left us more than mere traditions of heroic defense in battle and of attempts to lead a spiritual life in the wilds of America.

Their descendants are no longer Germans but have been Americans for generations. The Puritans of New England, although they have retained their language, and though their names have descended unmodified to the present generation, have probably changed as much.

To the American pharmacist, contemporaneous history and the history of the immediate past may be as intensely interesting as that of the period or periods when his art was practiced by the priests in the temples of Egypt or Greece, or when an apothecary introduced a Scheele, a Lavoisier or a Liebig into the art of pharmacy.

It is generally acknowledged that pharmacy in this country is passing through a period of transition. Will it rise to the dignity of a learned profession or will it degenerate completely to a mercantile calling, is the question which constantly presents itself for discussion wherever pharmacists gather.

A problem which is of equal interest to the present student of history is to ascertain the influence that European institutions and Europeans themselves have had in shaping the present *status quo* of American pharmacy.

It may be said without doubt that the Frenchman has made but an ephemeral impress, if any, on American pharmacy. His general civilizing power on this continent has not been of great permanence. From the Englishman we no doubt have received the *laisser faire* policy in business and profession. Such restrictions of trades and professions as were traditional in Old England could find but limited application on a new continent. The theories of Adam Smith found little to contend with in this country; when unchecked by tradition they could find almost universal application and sway.

German influence, in pharmacy at least, was quite to the contrary. It is not without significance that pharmaceutical legislation soon followed the immigration of the better class of Germans. The protection of the public against the ignorant practitioner is irrevocably bound up with the history of pharmacy and medicine in Germany. That the educated German apothecary, who has come to this country, has given his impress to American pharmacy is undeniable.

If a careful investigation were made of the career of German apothecaries who have come to this country many interesting facts would be brought to light.

It might be shown that most so called "*deutsche Apotheker*" would not be entitled to this name in Germany, because they had not completed their course of study. Comparatively few had attended the university and had passed the state board examination, which is necessary before the title *Apotheker* can be assumed. Behind the coveted sign of *Deutsche Apotheke* there stands, in this country, many a man who has not even been in Germany, but has in this country served an apprenticeship with a socalled German apothecary. Yet among the latter class are some of the most successful, in a financial way, of our German-speaking pharmacists. Of the academically educated pharmacists many have been lost to pharmacy in this country, because their true value was unappreciated or even unknown within their own ranks. Of the few who have remained true to their profession, the majority are not found in conspicuous places. On the other hand, some favored few with less education and ability have been professors or have held other positions of confidence and esteem.

These general remarks made by way of introduction will, it is hoped, help to pave the way for a better understanding of a person who has spent the best years of his life in advancing the cause of professional pharmacy, particularly in this country, and who though widely known has not always, perhaps even seldom, been understood.

Frederick Hoffmann was born on the twentieth day of June, 1832, in Wriezen on the Oder. His father, who was pastor, and rector of the city schools, left soon after to assume the duties of pastor in Lunow on the Oder. Frederick was prepared for the *Gymnasium* by private instruction from his father, who was as good a philologist as theologian. He was admitted as *Tertianer* in the *Alumnat* of the *Joachimsthal Gymnasium* in Berlin. After an attendance of two years he left at Michaelmas 1847 to enter the pharmacy of J. F. Holtz in Prentzlau, as apprentice for four years. The preceptor, who was rather advanced in years, demanded strict discipline. In those days the apprentice was still addressed with "*Du*" and his duties were not always agreeable. Although his apprenticeship would today be considered austere, yet such training created a class of apothecaries who were exact even in small things, and who were imbued with a high sense of order, duty and responsibility.

Hoffmann's preceptor tolerated study only in the evening after the apothecary-shop had been closed, and then only to a limited extent, for the use of lamps in the attic chambers was not allowed. Neither the preceptor nor the assistant gave any instruction. Hagen's and Buchner's handbooks, Dulk's Commentary of the Prussian Pharmacopoeia, and a flora of the province of Brandenburg were the literary resources of the apprentice. In the second year he obtained a copy of Stöckhardt's Schule der Chemie, which had just appeared. This book became a special source of enthusiasm and inspiration. With the aid of this book, and without the permission and knowledge of the preceptor, experiments were made, particularly in qualitative chemical analysis. During the last two years the young apprentice worked out a problem for which the North German Apothecaries' Society had offered a prize. The successful competition carried with it no small embarrassment, inasmuch as the strict preceptor learned of the secret occupation of his apprentice. The reprimand was not administered, however, without an expression of appreciation. He became more tolerant, and during the summer months permitted several hours in the early morning to be spent in making botanical excursions. During this period Hoffmann took another prize for a competitive paper entitled Reinigung des Weinsteins.

Having served his time as apprentice, Hoffmann remained another half year as assistant. He then served in a similar capacity during the years 1851 to 1854 in Magdeburg, Erfurt and Suhl. In 1853 he contributed a paper on burnt magnesia to Hirzel's Zeitschrift, in which his prize papers had been published. During the same year he delivered an address on the Value of Pharmaceutical Societies, before the German Pharmaceuten-Verein.

It is but natural that this young assistant who was willing to deprive himself of rest and sleep, at night to make chemical experiments, or in the early morning to go on botanical excursions, was an ardent devotee and advocate of science. The following paragraph, quoted from this address, is characteristic of the youthful scientist bubbling over with enthusiasm.

> "Sollte nun Jemand fragen: Was haben wir von der Wissenschaft, welche Vortheile gewährt sie uns? so ist diese Frage total unwissenschaftlich; denn die Wissenschaft ist sich selbst Zweck, nur um ihrer selbst willen treiben wir sie. Wer pecuniäre Vortheile und materiellen Nutzen sucht, der wende sich an alles Andere, nur nicht an die Wissenschaft; sie verlangt ein uneigennütziges und selbstständiges Interesse. Unbelohnt lässt sie indess ein edles Streben nie, denn ein reiches tiefes Wissen ist ein unvergänglicher Schatz, der den Geist veredelt: es ist ein sicherer Führer und Kompass durch die Irrgänge des täglichen Lebens und versüsst die oft lästigen Arbeiten eines einförmigen Berufs. Gewiss wird Manchem von uns unser Beruf oft langweilig und einförmig erscheinen; aber das ist er nur, wenn wir den Apotheker zum Empiriker, zum Kaufmann herabwürdigen. Treiben wir die Pharmacie als Wissenschaft und ergeben wir uns ihr mit selbstständigem, wissenschaftlichem Interesse und regem uneigennützigem Streben, dann werden jene unzufriedenen Stimmen seltener werden, und wir werden die Lasten und Entbehrungen, die unser Beruf erfordert, freudig ertragen."

Dr. Frederick Hoffmann.

At Easter, 1854, Hoffmann entered upon his studies at the University of Berlin. He attended the lectures of Otto Berg on botany, pharmacognosy and microscopy; of Dove on physics and meteorology; of Heinrich Rose on experimental inorganic and organic chemistry and pharmacy; of E. Mitscherlich on chemistry and phyto-chemistry; of Ehrenberg on physiology and microscopy; of Alexander Braun on natural history and botany; of Klug on entomology; of Johannes Müller on physiology; and of Ritter on comparative geography. Many of Hoffmann's later writings bear witness to the inspiration derived from these men. In 1856 he passed the state board examination before the Medizinische Ober-Examinations-Commission. Having a great liking for botany and for scientific agriculture and forestry, and being encouraged by E. Mitscherlich, Otto Berg and Schultz-Fleeth, Hoffmann began studies along these lines in order to prepare himself as teacher at some agricultural school. Meanwhile his father had been transferred as counsellor of the consistory of Stettin. Inasmuch as six younger brothers had to be educated, Frederick, the oldest, could not expect his father to maintain him at the university a number of years after having completed his course of professional studies. Having taken his degree he therefore returned to pharmacy. For several years he held positions in Berlin, Friedland, Elberfeld and Stettin. Then for a year he was proprietor of a pharmacy in a small town in Pommerania.

At about this time French patentees of Lyons threatened the infant aniline industry in the United States with destruction by pushing their claimed patent rights. In this emergency the American manufacturers and importers looked about for a chemical expert to assist them in their case. Dr. Hoffmann was recommended to them, and thus it came about that he sold his pharmacy and came to New York in 1867. A brochure entitled: "A critical rewiew of the history of aniline and the aniline colors" was the literary product of his first labors on the American continent. This at once established his reputation as a chemist. After the successful completion of his duties in this direction, which was of no small import in the effect it had on the development of American chemical industry, Hoffmann established himself as consulting chemist. Especially as chemist for several large cotton factories he found renumerative and instructive employment. At the same time he examined commercial chemicals, and gave instruction in chemical analysis in Professor Boeck's flourishing technical school for engineers and chemists. He also gave instruction in physics and chemistry in the most important private German school in New York, that of Dulon, Gehrke and Koessly. During this period he delivered a number of scientific and popular-scientific public lectures and wrote articles of similar character for the New York Staatszeitung, Lexow's Belletrisches Journal and Caspar Butz's Deutsch-Amerikanische Monatshefte.

At this time New York was not overrun with drug-stores as it is today, nor did the soda-water fountain with its accessories play such an important role. The association with German physicians and apothecaries revived the old love for pharmacy. The result was that in 1866 Hoffmann bought the drug-store of a Scotch physician in one of the more densely populated quarters of New York. This he, however, soon sold back to the original owner in order to purchase one of the older and most important German pharmacies, which he conducted successfully for sixteen years.

During this long period as practicing pharmacist, Dr. Hoffmann was not only a successful business man but served both physician and general public in a truly professional capacity. His opinion as a pharmaceutical expert was frequently sought by physicians. He also continued his work as analyst. In spite of these numerous duties he found time for scientific and literary work. Pharmaceutische Briefe aus Amerika, On Cremation, German Universities, Centennial of Chemistry, Chemie des Pflanzenwachsthums, Biographical sketches of Ehrenberg, Wm. Proctor, Heinrich Dove, John M. Maisch and Fr. Mohr, all date back to these busy years. But these papers were of minor importance when compared with the results of the author's labor in other directions. In 1869 he prepared the annual report on the progress of pharmacy for the American Pharmaceutical Association. This report was one of the best, if not the best, ever written for the national association and deserved all the praise which Professor Proctor, then editor of the American Journal of Pharmacy, bestowed upon it.

Dr. Hoffmann, however, was not only a master of scientific pharmacy. In general professional and educational matters he was both pioneer and master. When in 1871 an absurd pharmacy law was forced upon the druggists of New York he fought successfully against the same with the pen and before the legislature. His Essays on Pharmacy in Prussia and the German Empire, and Problems and Future of Pharmacy in Germany received considerable attention abroad and show how large and widespread was his influence in professional matters. In like masterly manner he fought against the nostrum evil in 1874 and 1876.

The United States Pharmacopoeia of 1870 was sadly in need of revision. Dr. Squibb had suggested a plan for revision and had been seconded in his work by the American Pharmaceutical Association in 1876. He then laid the matter before the American Medical Association at its meeting in Detroit. Instead of receiving the support of this association he was literally buried under personal slander. Discouraged, he was about to give up all further attempts. At this critical moment Dr. Hoffmann clearly reviewed the situation and brought it forcibly to the attention of the American Pharmaceutical Association at its meeting in Toronto in 1877. A set of resolutions demanding a change was adopted. The national convention, a self-constituted body, was made up of representatives of a host of medical and pharmaceutical associations and colleges, the former predominating largely. The American Medical Association and the American Pharmaceutical Association, the most representative medical and pharmaceutical organizations, were not represented. The adoption of the resolutions already mentioned was the first step taken toward a larger and more adequate representation of pharmacists on the Committee of Revision elected by the National Convention of 1880. This change has been accompanied by a decided improvement in the scientific character and value of the sixth and seventh revised editions of the United States Pharmacopoeia.

In 1873 the first edition of Hoffmann's Manual of Chemical Analysis was printed. This book filled an important gap in American pharmaceutical literature, and a second edition became necessary in 1877.

In educational matters Dr. Hoffmann also took a lively interest, as is shown by several articles. As a member of the New York College of Pharmacy he delivered an address before the same in 1874 on "The application of the microscope in pharmacy and the drug trade." This lecture was the first of its kind in America and the first demonstration illustrated by excellent mounted specimens of pharmacognostical microscopical slides. Dr. Hoffmann, having been a student with Ehrenberg and Otto Berg at the University of Berlin and an assistant of the latter, had a large collection of such slides, including the famous collection of C. Rodig. From this the late Prof. Maisch became first acquainted with such collections, and later on secured one for his own use, which is now a part of the collection left by him to the Philadelphia College of Pharmacy.

Inasmuch as many pharmaceutical writers in recent years have implied that they had done pioneer work in introducing the microscope into pharmaceutical education, The Pharmaceutical Era only little more than a year ago saw fit to republish this article, calling due attention to Dr. Hoffmann's services.

Minor articles of this period can well be overlooked when there is such an abundance of valuable material. And all this was accomplished during the busy life of a practicing pharmacist. It is not necessary for pharmaceutical teachers, who wish to encourage their students to continue their scientific work after leaving college, to go back to past centuries in order to find illustrations of what can be achieved by a pharmacist in spite of long hours of duty behind the counter and the prescription case. The enthusiast who loves his profession, and who has not selected his calling for purely material reasons, will find time for scientific work, if not during the day, then at night.

In 1881 Dr. Hoffmann was appointed as one of the three experts of the newly-created State Board of Health. He held this position until 1883 when the necessary funds were withdrawn by the legislature. During these two years he wrote two reports on the examination of medicinal drugs and chemicals. In 1883 the third edition of the Manual of Chemical Analysis was also published. In the revision the author associated with himself Dr. Frederick B. Power.

Beside the article "On the application of the microscope in pharmacy and the drug trade" republished by the Pharmaceutical Era in 1894 there are other articles that might well be reprinted today, so masterly were they written. In the development of American pharmacy these articles have no small mission. Yet all these years of self-denying labor in behalf of truly professional pharmacy, with their many masterly achievements, are but as the *Lehr- und Wanderjahre* of Dr. Hoffmann, the editor. A student *par excellence* from his apprenticeship days to mature age; an investigator almost from the very beginning of his pharmaceutical career; with a natural love for plant life, yet through circumstances a chemical expert; with a practical knowledge of everyday pharmacy on both sides of the Atlantic; a keen observer of the advantages of professional pharmacy as well as of the shortcomings of the drug-trade; an enthusiastic devotee to all that is ennobling in the calling of the pharmacist; a counsellor in matters pertaining to scientific pharmacy, pharmaceutical education and legislation, an *Apotheker vom alten Schrot und Korn*, yet with ideas in advance of most of his colleagues and with no mean literary ability to make his ideas clearly understood; a personal acquaintance of most men ranking high in pharmacy both in Europe and America; such is Dr. Hoffmann preparing his first manuscripts for the Pharmaceutische Rundschau in the Catskill mountains in the late summer of 1882. Recognized master as he is at the time, the true *chef-d'œuvre* still lies before him at the mature age of fifty. The editor enters upon his duties, not as apprentice, but as master.

The thirteen volumes of the Pharmaceutische Rundschau are a monument to their founder and editor more lasting than marble or bronze. If one takes into consideration that in filling 3700 double column quarto pages the editor was dependent to no small degree on his own resources, the work assumes an almost stupendous magnitude.

Aside from the excellent monthly reviews and literary criticisms and the numerous original contributions, there appeared no less than 300 editorial articles. No other pharmaceutical editor in this country has ever wielded the editorial pen with such power and authority as did Dr. Hoffmann. He has not only acted as a reporter and recorder of pharmaceutical events, but as Prof. Flückiger wrote in 1888 has given a true picture of pharmacy, particularly of pharmacy in the United States, which will be useful for all times.

> "Es ist ihm Herzenssache, die Erfahrungen und den intellektuellen Gewinn einer vielfach bewegten, selbstgeschaffenen Laufbahn seinem Berufe nutzbar zu machen. Wir erkennen die ideale Gesinnung und Absicht des Herausgebers, sich durch Förderung und Hochhaltung der besten und am meisten erhaltungswerthen Interessen und Aufgaben der Pharmacie dem liebgewonnenen Berufe dankbar zu erweisen und für den gedeihlichen Fortbestand desselben, für dessen ursprüngliche, wie für neu entstehende Aufgaben, zwar nicht im alten Vaterlande, sondern in der neuen Heimath nach besten Kräften und in redlichem Streben mitzuwirken, wie er es eingehender im ersten Bande der Rundschau auseinandergesetzt hat."

That Dr. Hoffmann should have come in conflict with many evils that are incidental to the juvenile period of American pharmacy can only be mentioned to his credit. With a strong inclination to optimistic ideals, but not blind to the shortcomings of an aspiring profession, he has measured the standard of pharmacy by a lofty measure. His outspoken sense of truth and his emphatic opposition to everything sham has ofttimes led to misunderstanding on the part of those who possibly tried to do well but failed in great part. Whereas even his enemies cannot deny him their admiration, yet both friend and foe have been inclined to regard him as being pessimistic. It is true that the critic reared and educated in Europe may, in judging American conditions, easily do injustice to the laborers in the American field. Prof. Flückiger, who until his visit to the United States in 1894, regarded everything pertaining to pharmacy in America in a very rosy light may for this very reason be considered as an impartial judge. He wrote the following words on this very point for the Pharmaceutische Zeitung in 1888.

> "Für den aus deutschen Verhältnissen und Anschauungen hervorgegangenen Kritiker liegt die Gefahr sehr nahe, in bester Absicht über das Ziel hinauszuschiessen. Diese Klippe versteht Dr. Hoffmann, wenn wir richtig sehen,

mit grosser Umsicht zu vermeiden. Langjährige Erfahrung, die ruhige Ueberlegung des reiferen Alters, das Bewusstsein eines reinen selbstlosen Strebens drücken der Pharmaceutischen Rundschau einen uns in hohem Grade anmuthenden Stempel auf. Der Erfolg dieser Zeitschrift spricht laut genug dafür, dass die Befähigung und die Berechtigung ihres Gründers und Leiters, wie nicht minder die Lauterkeit seiner Absichten in weiten Kreisen gewürdigt werden. Im Interesse unseres Standes, im Interesse der amerikanischen Gesundheitspflege muss man aufrichtig wünschen, dass jener Erfolg sich mehr und mehr befestige und zur Freude des opferwilligen Herausgebers sich je länger je wirksamer erweise."

If Dr. Hoffmann is a pessimist, then it were good for American pharmacy if it had more of this class of people. It is true that when only twenty years of age his experience had taught him to regard the drug business as a failure and in his address before the Pharmaceutische Verein he emphasized this fact. At the same time, however, he pointed out the path which the pharmacist must follow to make his profession a success. This double action is characteristic, not only of Hoffmann, the "Apotheker Gehilfe," but of Hoffmann the practicing pharmacist and editor. His criticism is never destructive but constructive. The enthusiastic apprentice who after long hours of hard work, will deprive himself of his night's rest in order to grapple with the elements of science; the practicing pharmacist, who in spite of the day's labor of professional service, finds time not only for popular scientific lectures and pharmaceutical work of a high order, but who is foremost in the ranks of his profession in all emergencies; he, who is pointed out as an impractical idealist and optimist, when he bears high and successfully the standard of his profession; can hardly be branded a pessimist when he becomes a critic of the shortcomings and diseases of the calling that he loves and to which he has unselfishly devoted a lifetime.

The true merits of Dr. Hoffmann have always been recognized by those who loved truth more than flattery. Most of his writings were probably above the appreciation of the average American pharmacist. It is probably but natural, therefore, that our profession at large in this country should have been slow in showing its recognition of his valuable services. On the other hand, pharmacists of various European countries have in part made up for our lethargy. Dr. Hoffmann is an honorary member of several European societies. He is one of the two Americans who have been honored with the Flückiger medal.

The fact that Dr. Hoffmann in late years has possibly taken more delight in his books than in meetings of pharmaceutical associations is but natural to advanced years. Says Goethe: "Je mehr sich unsere Bekanntschaft mit guten Büchern vergrössert, desto geringer wird der Kreis der Menschen, an deren Umgang wir Geschmack finden." Others, who have held and still hold prominent positions in the pharmaceutical ranks, have likewise withdrawn, some even at an earlier age, from promiscuous pharmaceutical gatherings. Yet those who today strive for truly professional pharmacy may well study the lives of those who in the past have successfully advanced the cause of pharmacy. If they wish to succeed they must make some of Dr. Hoffmann's mottos their own.

"Wer da fährt nach rechtem Ziel
Lern' am Steuer ruhig sitzen,
Unbekümmert, ob am Kiel
Lob und Tadel hoch aufspritzen."

Whatever may prove to be their lot, they will in advanced age, like the subject of this sketch, reflecting upon the events of several generations, be able to look back upon the past and into the future in the same calm mood in which the editor of the Rundschau wrote the closing paragraph of his last masterly "Rückblick":

"Das Alte stürzt, es ändert sich die Zeit,
Und neues Leben blüht aus den Ruinen."

The mind of one who can repeat these words at the age of more than sixty has certainly not become crystallized, but shows a capacity for accomodation that but few are privileged to enjoy. It is a guarantee that Dr. Hoffmann, as one of the editors of his metamorphosed journal, will still remain the central figure of his own creation. His many friends, as well as all the readers of the Pharmaceutical Review, will be glad to know that retirement from the more active duties of management does not imply a loss of interest or the intention to become idle in matters pertaining to pharmacy, of which he and his journal have been such prominent exponents. E. K.

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Retrospect.

IN entering upon the work of a new year it is no doubt important to reflect for a moment upon that which has been accomplished during the year just concluded. In looking back with calm judgment upon things in their proper relation we are likely to estimate them more correctly than in the excitement of the moment, when objects or events are ofttimes seen distorted or removed from their proper surroundings. The alpine climber likes to pause as he rises from cliff to cliff, from alp to alp, enjoying ever larger views as he ascends. The individual objects that attracted his attention on the way blend more and more into the landscape, and instead of losing in interest they simply gain thereby. The Pharmaceutische Rundschau in the past has not only reviewed the various aspects of pharmacy from month to month, but from year to year as well, ever widening its horizon as volume was added to volume.

With the general improvement of business the **commercial and financial position of the druggist** has assumed a brighter aspect. The demand for medicine, it is true, is not apt to undergo great fluctuations on account of commercial or financial complications. The professional pharmacist, therefore, was not so prone to failure financially as many others in callings purely commercial. Inasmuch, however, as the stock of the average drugstore is largely made up of things other than drugs, most druggists have been influenced more or less seriously by the general financial and commercial depression. Now that we can look back on this financial crisis it is surprising that with the enormous competition in the drug-trade and with the large amount of practically dead stock in patent and proprietary medicines, which the druggist is compelled to keep on account of an over credulous public, comparatively few druggists have been forced to the wall. During the last few years it was observable that whereas many supposed reliable business houses failed, the older pharmacists known to be professionally competent and enjoying the full confidence of their patrons apparently suffered least from the general business depression. The more professional the duties of the pharmacist the less apt is he to suffer from such crises.

The commercial druggist, on the other hand, must resort to all sorts of advertising schemes to find sale for his ware. Hence results the cutting of prices of patent medicines and advertisements of rather questionable character. Advertisement has already become an important department in a certain class of pharmaceutical journals of this country. That at such a time the question **"Is pharmacy a profession or a mere trade"** should receive attention is but a natural outcome of the situation.

If the "college professor" argues that pharmacy is a profession because several thousand young men spend a few winter evenings in the college amphitheater, whereas at the beginning of this century we had no colleges of pharmacy whatever, he may induce the college graduate to rise higher in his own estimation, but his supposed argument is no argument at all. There are many polytechnic schools in which boys and girls are taught trades. Cooking schools exist to-day, which were unknown a century and less ago. The Bridget who attended a course of lectures on cooking and who took a series of practical lessons might as well aspire to be able to yield professional services. The polytechnic schools do excellent work indeed, all the more excellent because they do not inflate the brains of their pupils with the thought of being members of a learned profession.

If on the other hand the commercial druggist says that pharmacy is no profession and that it never was a profession, he may, considering the world at large and this country in particular, not be very far from the mark; but are men with barely the rudiments of a grammar school education competent to judge what is to constitute a learned profession. This reminds us of the circular sent out by the educational section of the American Pharmaceutical Association several years ago, asking the druggists of this country, "what in their opinion ought to be taught in a college of pharmacy." It must however be said to the credit of the American druggists that with very few exceptions they were wise enough not to respond to this query.

A similar experiment was tried last year at the International Exposition at Venice with a less fortunate result. Popular suffrage was applied to the awarding of a prize for works of art. A reporter of the event, after describing the disgraceful painting which received the first prize, remarks "That the prize was awarded by popular vote speaks ill for the morals and worse for the taste of modern Italy."

Pharmacy has come into life as the hand-maid of medicine. In Europe she is still more or less under the superior control of the greater branch of the mother profession. In this country she has well nigh emancipated herself and is struggling for recognition in her independent position.

In Germany, where the educational requirements of the pharmacist are not as high as those of the physician, the former has been made to feel his inferior position, often in a very unpleasant manner. The result has been, that whereas there are still many who look forward to an improvement of pharmacy, placing it ultimately on the same plane with the other learned professions, an appreciable number have given up all claim to a professional calling and want to be considered merchants working with a high percentage of gain.

That in this country, where pharmaceutical education is still in its infancy and where most druggists have never seen the inside of a college building, even this last remnant of a professional spirit, viz., the working for high percentage profits, should have largely been lost can surprise no one. Although there are many who curse the cutter and the department store, yet there are more moving ostensibly or unostensibly with the current of the cutter. The number that considers pharmacy as a business like any other business is no longer small.

In Germany this conclusion appears as the result of a pessimistic spirit of the educated proletariat, fostered no doubt by the present high price of pharmacies on account of the system of state concessions. In America it is but a logical conclusion of prevailing circumstances. Men who have learned the "drug business" and nothing but this aspect of pharmacy, must ultimately acquire this view of their calling. They may denounce the cutter or the department store, but this is to a large extent simply a matter of protective business policy. The really true pharmacist will be only too glad to leave toilet articles to the general merchant, and secret remedies, so-called patent medicines, even to places that will bring them into greater disrepute.

It must be a matter of interest to every careful observer that England is undergoing a similar evolution. The development has reached such a stage that one of the leading pharmaceutical journals of Great Britain expounds the doctrine that "pharmacy is content to be a trade" and that the president of the British Pharmaceutical Conference finds himself constrained to rouse the truly professional remnant to greater activity.

This struggle which is going on in almost every civilized country on the globe is one of intense interest to the student of civilization. Will the tradesman or the professional scholar succeed respectively in lowering or in raising his calling? Or will America follow some of the European countries in creating pharmacists of the first and second class, Apotheker and Drogisten? This classification evidently has not simplified matters in France or Germany. It is to be hoped that this country with its possibilities for the future, will demand but one class of pharmacists and compel these to be professional men, by an educational standard which is high enough to remove excessive competition and to enable every pharmacist to obtain a professional remuneration for truly professional work.

It must be frankly conceded that the average American druggist is not a professional man. To make the professional pharmacist—not the individual, but the class—possible, the ranks of the druggist must be well nigh decimated. This cannot be done by a system of concessions nor by any other form of commercial protectionism. It can be accomplished only by demanding a **high educational standard,** which will bar all but the very best. Legislation will have to assist in bringing about this result, but it is primarily a matter of education. Legislators and the people at large must first feel the need of such requirements before they can be demanded. First of all the schools and colleges of pharmacy must create a nucleus of educated men willing to devote their lives to a profession which remains largely to be created.

Many changes have been announced in pharmaceutical education during the past year. The one which has attracted the greatest attention is no doubt the extended use to be made of the degree of doctor of pharmacy. In Europe this degree evidently has come entirely into disrepute. In this country it has survived, but has had only a questionable merit. Now it is to come to an unprecedented honor and to kindle into flames the remaining spark in the ashes of ruined pharmacy. Whether the wide-spread use of the doctor's degree in pharmacy will have this effect or whether it will contribute to the degeneration of the doctor's degree in general, time alone can decide.

A more modest but all the more genuine method of improving the general status of pharmacy is being tried with no mean success. Several large state universities are now offering courses in pharmacy equal in educational value to the other four years' courses of these institutions. This alone can place the pharmaceutical student on a par with his fellow student at the university, and later with such men in other walks of life, as have enjoyed a liberal education.

Those who favor a liberal education of the pharmaceutical student certainly have good reason to rejoice in spite of the present low status of pharmaceutical education in general. The fact that the number of pharmaceutical educators who favor the abolishment of apprenticeship and the substitution of a good secondary education in its place is growing in an entirely unexpected manner, is certainly most encouraging. Even the staunch defenders of the old system are providing loopholes, through which the non-experienced student may creep. That some of these schools are adding to their curricula, though principally in the extension of their evening lectures, will no doubt help in advancing pharmaceutical education in general.

Americans are apt to consider that European institutions and customs are crystallized so thoroughly that changes are next to impossible. This is by no means peculiar to Europe. Harvard and Yale to-day close their doors to women, while German universities are opening theirs. German university professors are among the strongest advocates for the admission of women, not only to the university but to the examination for the doctor's degree as well.

Gymnasia are being erected to prepare German girls for university studies. The minister of education himself is ready to encourage the admission of women to pharmacy. All of this in conservative Germany with its tradition to the contrary.

Our pharmaceutical colleges of fifty or at most seventy-five years' standing have been very slow in introducing laboratory methods of instruction. It is but a year that the oldest college has required a very small amount of laboratory work in botany. Equally slow are these older colleges in introducing other modern scientific methods of teaching, and discarding quasi-educational remnants of the past. The year just ended, however, goes on record as a compromise landmark in this respect.

Whereas the German pharmaceutical professors at Russian universities have been given their passports, Germany herself is awakening to the need of better pharmaceutical education in the imperial capital. A docent in pharmaceutical chemistry has been appointed at the University of Berlin. Let us hope that the dreams of Prof. Flückiger and others who have at heart the welfare of pharmaceutical education may soon be realized in that country in which a realization of the same is best possible. Hessia (Marburg) and Switzerland (Bern) have set examples for Europe, which Prussia cannot ignore. The University of Berlin cannot long afford to have a pharmaceutical institute second to those of provincial universities, it must soon have the very best of all.

We may well rejoice in this hope because its realization will prove most beneficial to American pharmaceutical institutions. The number of American students abroad in almost all departments of science and art is very large. American pharmaceutical students at German universities however have been few and far between. The articles on German universities that appeared in this journal during the past year have assisted in calling the attention of the pharmaceutical students to the facilities for study offered at these venerable seats of learning. Those who go abroad will return stimulated by the scientific atmosphere that pervades German university laboratories.

The more Germany can offer to American pharmaceutical students, the more will pharmacy in America profit. It is to be regretted that the American Pharmaceutical Association is so slow in recognizing its opportunities by sending deserving young men abroad for study and research.

Pharmaceutical legislation like pharmaceutical education in this country is in its infancy. The results of a quarter of a century of pharmaceutical legislation have been admirably reviewed by the authoritative pen of Dr. Hoffmann. (Rundschau, '95, p. 99.) It has been pointed out that the faults of all pharmaceutical legislation in this country arise from one of two causes: i. e. ignorance of both legislators and pharmacists in this important field of jurisprudence, and lack of power or negligence on the part of the authorities to execute the laws.

Optimists have expected that these laws would prove a panacea for all pharmaceutical evils and they were of necessity disappointed. To be equally pessimistic now and claim that no good whatever can result from pharmaceutical legislation would be equally foolish.

Even if our laws had been perfect in theory, their application on account of the second cause mentioned above would have been faulty. Yet it is certainly preferable by far that pharmacists inexperienced in legislative matters should control their own profession, however faulty, than that lawyers or physicians, as is the case in Germany, should become their superiors. To have one profession controlled by another is most pernicious, and is detrimental to both.

The American pharmacist has had to go through a school of legislative experience. It is to be hoped that some at least have profited by the same and are able and willing to give us better laws and a more rigid and common sense enforcement of them than we have had in the past. Whereas the Ohio Food and Drug Commission has enforced the laws in a most barbarous fashion, exposing everything to the public gaze and curiosity, Wisconsin has during the past year in a more friendly and educational yet forcible manner demonstrated that the laws in this state are not altogether a dead letter.

One of the grave faults of all pharmaceutical legislation in this country has been the laxity of educational requirements of prospective pharmacists or assistant pharmacists. The educational standard has almost entirely if not entirely been left to the State Boards. Many if not most members of these boards were and still are totally ignorant of methods of examination, if not even of the rudiments of scientific pharmacy.

The result has been that quiz-compends and books of like educational detriment have been recommended to and used by pharmaceutical candidates. Inasmuch as not even more than 10% of the druggists are graduates it can surprise no one that really little genuine educational advancement has been effected by pharmacy laws.

It would seem that the State Board of New Jersey has for the first time recommended a course of study to its prospective candidates. Even if the requirements of this course are very modest, it is to be hoped that it may prove the stepping stone to something better. If such an examination were placed in the hands of a physicist, a botanist, a chemist, and a practicing pharmacist instead of being left entirely to practicing pharmacists, the result might be encouraging indeed. The last legislature of Wisconsin has also taken a step in advance. The amended law of this state places a premium on a fairly thorough pharmaceutical education by permitting graduates of the University of Wisconsin "and other schools offering a similar course," to present themselves for the licentiate examination after two years of practical experience. The new State law of Illinois requires a registration of apprentices.

Thus, in spite of the ineffectiveness of much pharmaceutical legislation, a calmer and more experienced sentiment is pointing the way to better and more efficient legislation. Not until every State law demands a high educational standard can much good be expected from pharmaceutical legislation.

The attempts of the **American Pharmaceutical Association** during the last three years to legislate in the line of pharmaceutical education have utterly failed. They have simply increased the strife existing between factions trying to secure legislation favorable to one party but ruling out the other. Such legislation, it is true, will bind no college, but it may be used as an advertisement by those favored. This strife will not cease until the American Pharmaceutical Association recommends a course which all schools and colleges may honestly strive after. Let other courses of whatever nature take care of themselves. Judging from past experience it might be best if the American Pharmaceutical Association abstained from all similar legislation. It would sometimes appear that the best results which the American Pharmaceutical Association accomplishes is the bringing together of its members in a pleasant outing.

Most **state pharmaceutical associations** have for some years come to this view of association meetings. The business meetings are kept up and some show is made in the reading of papers, but the prime object of attendance with most druggists is to enjoy an annual outing with cheap railroad fares. In many States the greater part of the day is given to a great "Kirmiss." The number of prizes offered at one meeting during the past year was almost equal to the number of druggists in attendance, including their ladies. The druggists or rather the drummers acting under the auspices of the druggists' association, gave the town a free show and plenty of material for cheap talk. It is not surprising that the better element of the city was disgusted, and that physicians looked at the spectacle with a superior and derisive air. Such state associations are doing their very best to lower themselves in the eyes of everyone. That the public feels as safe in buying from the cutter and the department store as from such people is not surprising. Many of the better element stay away in disgust. It is to be hoped that those who have a sense of professional pride and the interest of their calling at heart will come forth and use their influence to wipe out this evil.

The year following the issue of the seventh edition of the United States Pharmacopoeia witnessed the publication of revised editions of most of the standard American **text and reference books.** Nevertheless the year 1895 has not only brought new editions of older works, but has also impressed its stamp upon the title pages of several new ones. That German books should nevertheless outnumber the American in no small ratio is not surprising.

Not only are pharmaceutical books and journals as well as schools on the increase, but the number of **new drugs, chemicals, and pharmaceutical preparations** is increasing in an almost frightful manner. If the pharmaceutical student were to study each and every one separately he might justly become despondent. Fortunately the scientist's knowledge grows with the number, so that he can generalize and classify more thoroughly. If the physical and chemical properties of the elements are functions of their atomic weights and if their physiological effect is due to chemical action, then the physiological properties of the elements must also be functions of the atomic weights. If the physical and chemical properties of a compound are due to its structural composition, the physiological properties must likewise be dependent on the same. This has been recognized for some time and is not a thing of yesterday as some American writers seem to imply. Not only have the physiological properties of the elements, rare as well as common, been studied at Tübingen, the home of the periodic system, but pharmaceutical chemists in Germany have already devised methods for the preparation and purification of no small number of their compounds. It can only amuse our European colleagues that a pharmacist in America has, at this late hour, discovered the possible use to which the hitherto useless rare elements can be put in pharmacy.

Not only chemistry, inorganic as well as organic, is increasing our materia medica, but the vegetable kingdom, which had come somewhat into discredit as a supplier of medicine, is newly asserting itself. Forms of life practically unknown to our grandfathers and dreaded by our parents, are to-day giving up their own antidotes to suffering mankind.

Bacteriology, next to chemical therapeutics, is probably doing more at present than any other science to place medicine on a truly scientific basis. Not only has she taught the cause of many a disease and the methods of combatting diseases due to bacteriological action, but she has in recent years, supplied the healing art with several new remedies produced by bacteria. If it is the duty of pharmacy to prepare and dispense the remedies which the physician prescribes, then the preparation of the new bacteriological remedies is a legitimate field for new activity on the part of the pharmacist. The Fliegende Blätter no doubt fully grasped the situation in their mock illustration of Dr. Behring as Apothecary, showing the illustrious Berlin professor behind the counter of a drug store, selling the serum on tap from a live horse, while children and nurses, peasants and artisans with pitchers and beer mugs stand about clamoring for the life saving antitoxine.

The real situation is not quite as humorous. A frightful majority of pharmacists are totally ignorant of bacteriology. Even in Germany the average pharmacist could not be entrusted with the preparation of bacteriological remedies, if this were practicable. The Farbenfabriken and other chemical factories of Germany and the large pharmaceutical establishments of this country are supplying the physician to a large extent directly with these new remedies. This is another illustration of how pharmacy is being outstripped by other sciences. Chemistry and botany, whose cradles stood in the pharmacies of the fatherland, have long ago outgrown their common parent. Although a great deal has been said about the importance of bacteriology as a part of a pharmaceutical curriculum, yet very few schools of pharmacy in this country, and not one of the older colleges of pharmacy, have offered bacteriology even as an optional study. If the rank and file of American druggists know nothing about bacteriology, can it be surprising that only the pharmaceutical manufacturer reaps the harvest from this new field of truly pharmaceutical activity.

It would be wrong, however, to suppose that every pharmacist of the future must be an expert bacteriologist. Chemistry has not succeeded and possibly never will succeed completely in replacing vegetable drugs. It is not to be supposed that bacteriology will replace chemistry. In fact the present methods of preparing so-called bacteriological remedies are very crude indeed. As yet we know very little about the active principles of the same. After the physiological chemist has isolated the active constituent or constituents of these serums, the synthetic chemist will teach us how to derive these powerful remedies from more convenient sources than horses or sheep. Then the time will have arrived when the retail pharmacist, though he may not make all or any of these preparations himself, will be in position to control the purity of these remedies. It is to be hoped that pharmaceutical educators will anticipate this time and give their students an opportunity to become familiar with bacteriological methods and products, so that when called upon they may assume this responsibility.

In Memoriam. The recorder of pharmaceutical events of the past year is fortunate in being able to state that none of the leading pharmaceutical scientists have been taken from their fields of activity by death. The decease of the noble Professor Flückiger at the close of the year 1894 has been kept fresh in our memories through biographical sketches, of which those of Professor Tschirch (Berichte der Pharmaceutischen Gesellschaft) and of Prof. Schaer (Archiv der Pharmacie) are particularly interesting and valuable. Both writers had not only been closely associated with Prof. Flückiger for a long number of years, but also at present occupy positions at Bern and Strassburg respectively, which Prof. Flückiger occupied as teacher before them.

Sciences correllated to pharmacy have been less fortunate during the past year. Chemistry has lost its Lothar Meyer of periodic system fame. It is not much more than a year ago that Prof. Meyer wrote a biographical sketch of his deceased friend and former assistant at the University of Tübingen, Prof. Eugen Lellmann, for the "Berichte" of the German Chemical Society. No one then surmised that the master would so soon follow his disciple.

Physiological chemistry has also suffered loss through the death of Prof. Hoppe-Seiler of the University of Strassburg; physiology lost its veteran Prof. C. F. W. Ludwig of the University of Leipzig. James Dwight Dana, a scientific explorer of the Pacific and Antarctic Oceans and for forty years professor of geology and mineralogy at Yale, who died in his 82d year, was a prominent representative of American scientists and authors. Prof. Huxley, who assumed the duties of professor of natural history and physiology at the Royal Institution in the same year in which Dana was called to Yale, died about two months later. As philosophical writings his works are of more than passing interest. When the history of the relation of science and religion of this century is written Huxley's name will not have suffered through age.

France also mourns over one of her illustrious sons, one of the founders of a truely modern science, bacteriology. The hero-worship of the French for their dead of international fame is receiving a check from the pens of German scientists. Abstracts from older German journals are published demonstrating the fact that Pasteur was more fortunate in applying the observations of other scientists than as an original observer. The apotheosis of everything foreign on the part of Germans appears to have ceased with the development of German science. The unification of Germany in the realm of intellect initiated by von Stein had to be accomplished while political unity was still the patriot's dream. Illustrative of the end of the transition period is a paragraph from a letter written by Liebig to Wöhler in August 1870. Liebig writes from Munich: "Pasteur besuchte mich vor dem Kriege; er sprach mit solcher Verachtung von dem Könige von Preussen und dessen Anmassung, auf die Forderungen Napoleon's hin nicht zu Kreuze gekrochen zu sein, dass ich wahrhaft empört war." This, however, need not imply that Liebig did not understand, or undervalued, the eminent services Pasteur had rendered as a scientist. In Pasteur's work natural science applied has celebrated some of its greatest victories.

Although professor of chemistry at the *k. k. technologisches Gewerbemuseum* the death of Dr. Richard Godefroy has affected pharmacy directly, since for nine years he taught at the pharmaceutical school of the *Allgemeiner oesterreichischer Apotheker-Verein*, and for several years was its director. Though he died in the prime of life his work had met with general recognition throughout Europe.

Although the year 1895 will not go on record as the first of a pharmaceutical millenium, yet in looking back upon the year as a whole, the American pharmacist has good reason to feel that he has not labored in vain. The number of druggists is still too large to make pharmacy very profitable to any but a favored few. The present educational standard is still too low to permit of calling the American druggist a professional man. But there are exceptions and it is to be hoped that the exceptions may some day become the rule. Most pharmaceutical journals emphasize the business phase of the druggists' calling. In scientific productions American pharmacy is still far behind German pharmacy. Pharmaceutical education is still in its infancy. And yet, withal, the general atmosphere breathes progress. An enormous progress, however, is necessary. The general sciences have far outstripped the pharmaceutical sciences. The professions of medicine and engineering have developed more rapidly than pharmacy. That pharmacy has progressed while it was being outstripped by chemistry and botany is but poor comfort. Progress is relative and such progress implies retardation. If pharmacists would only look at the last century of their history in this light, it should not depress their spirit, nor make them despondent or pessimistic, but should stimulate them to unprecedented activity. We must learn to compare ourselves, not only with our forefathers and rest content that we have been moving onward, but with those about us. The American pharmacist, enjoying an independence from the medical profession such as the apothecaries of Germany cannot boast of, should not rest content with this equality before the law, but should strive to make his calling the peer of any learned profession of this country. This is the only standard by which he can hope to conquer. He who fights under this standard may derive new inspiration from the past year, though his path has not been smooth and though he has met not only with honest battle, but with foul play as well. Like the Knight Templar he must use both trowel and sword in the redemption of his profession.

The Pharmaceutical Review in its new garb will cling to its old principles. It sends New Year greetings for the first time in the English tongue not only to its old friends, but also to the many new ones that it soon hopes to find. Though the German language did not bar it from being truly national in its character, it hopes that the English tongue will assist in making it outwardly as well as in spirit American. *E. K.*

ORIGINAL CONTRIBUTIONS.

On Bismuth Subnitrate.

By Professor *Charles O. Curtman*, of St. Louis, Mo.

(Report No. 9 of the *Research Committee B*, U. S. P. Revision.)

It is well known that by treating bismuth nitrate, $Bi(NO_3)_3$, with water, very different products of bismuth subnitrate are obtained. The amount of water added, the temperature, the length of time the precipitate remains in contact with the liquid before filtering, the duration of washing and the quantity of water used in that operation, and finally the temperature and time of drying the finished product, all have their influence in producing salts of various compositions. Many of the precipitates are shown by the microscope to consist of minute crystals, so that they must be considered as definite chemical compounds, while others are amorphous. To secure products of uniform composition some pharmacopoeias give careful directions for the preparation, while others leave the choice of method of preparation to the manufacturer and confine themselves to prescribing tests for purity. The U. S. P. describes the salt as "of variable chemical composition" and its tests for purity refer to the absence of foreign metals, especially of lead, silver, copper and arsenic, also of ammonia, alkalies and alkaline earths, and of carbonate, sulfate and chlorid.

The only quantitative tests relating to the proportion of its normal constituents are implied in the description of the salt, which states that, when heated to 120° C., it loses water (from 3 to 5 per cent. of its weight) and when subsequently heated to redness, it leaves from 79 to 82 per cent. of its weight of a yellow residue. Hence when a salt complies with the tests for absence of foreign materials, a considerable limit is allowed in the relative proportion of nitrate, hydroxid and water.

The larger modern works on chemistry give numerous different formulae of bismuth subnitrate found by recent and older investigators, together with the conditions under which their formation was observed. Thus Dammer's Handbook enumerates nine, Michaelis seven, and in Flückiger's Pharmaceutical Chemistry we find three principal formulae distinguished as α, β and γ.

For some time past I had observed that of several specimens received for examination, none conformed exactly to any of the formulae published, most of them being deficient in acid. Few came within the limits of quantitative proportions stated in the U. S. P. which are the same as those of the German *Arzneibuch*, although in qualitative examination they complied with its demands. Of course the mistake of using tinfoil in Bettendorff's test for arsenic, to which I called attention about two years ago, was avoided, the concentrated solution of stannous chlorid being used alone.

For the purpose of investigating the subject more fully, I procured specimens from some of the principal manufacturers and determined in them not only the freedom from impurities, but also the loss of water by heating to 120° C. and the amount of residue of bismuth trioxid left on ignition, and lastly the percentage of nitric acid.

To facilitate the comparison of results, I give the proportions demanded by Flückiger's formulae:

$\alpha = BiONO_3 + H_2O$ [or as written by others: $Bi(OH_2)NO_3$] representing the salt as first precipitated.

$\beta = BiOOH + BiONO_3$, the same salt after protracted washing.

$\gamma = (BiONO_3)_4 + H_2O$, the salt formed by long contact with acid wash water.

Another formula contains the salt β with water: $\beta^1 = BiONO_3 + BiOOH + H_2O$.

Other published formulae demand a still larger proportion of nitric acid and need not be considered here.

These four contain as follows:

	Per cent. water lost at 120° C.	Per cent. Bi_2O_3 after ignition.	Per cent. NO_3, nitric acid radical.
α	5.894	76.413	20.311
β	—	88.101	11.709
γ	1.54	80.80	21.247
β^1	3.286	85.206	11.324

The seven specimens examined were all exceedingly light and voluminous, and would pass muster in regard to the qualitative tests of the U. S. P.

	Per cent. of loss at 120° C.	Per cent. of residue Bi_2O_3.	Per cent. of acid radical (NO_3).
1.	4.1	82.0	10.80
2.	5.9	82.5	11.45
3.	5.3	83.1	10.21
4.	3.2	85.0	9.90
5.	3.1	81.2	10.53
6.	3.0	82.0	11.45
7.	3.2	81.1	10.53

For the determination of the nitric acid several volumetric methods were tried on the same sample, and after finding that they gave substantially equal results and agreed well with some colorimetric tests, the following was adopted as the most expeditious for the examinations.

6.189 gm. (corresponding to the molecular value of the acid radical NO_3) of the bismuth salt were suspended in 100 cc. of water at ordinary temperature, a few drops of phenolphtalein T. S. were added, and then normal solution of potassium hydroxid, in small portions with vigorous shaking until the red color remained permanent for ten minutes. The number of cc. of normal solution used directly indicated the percentage of NO_3. (If only 1 gm. be taken, the number of cc. of solution used must be multiplied by 6.189 to obtain the percentage of NO_3).

The results show that Nos. 2, 3 and 4 exceed the limit of residue of Bi_2O_3 given in the U. S. P. (and in the German *Arzneibuch*); also that Nos. 2 and 3 lose more water at 120° C. than prescribed. The water lost at that temperature is the more loosely combined water of crystallisation, while the separation of the water formed from the hydroxid requires a higher temperature.

The specimens examined are nearly all more basic than is demanded by the four formulae above given. All of the other formulae enumerated in the books require still more acid. So that we must either consider our commercial products as having more basic formulae, or else that they are mixtures in indefinite proportions of bismuth hydroxid with the real subnitrate. The latter is most likely the correct view. For the calculation of the actual proportions leads to formulae of such complexities, that it is not likely that they have any existence in fact. The crystalline appearance under the microscope does not necessarily indicate that we have but a single salt, but may be due to successive crystalline deposits of salts of different compositions, varying in proportion according to the different methods of manufacture.

Clinical experience with these more basic preparations can alone decide whether they are sufficiently useful to recognize them by enlarging the pharmacopoeial limits, so as to include them in the official standard.

While experimenting with the above and other specimens I experienced a difficulty that may be of sufficient interest to mention. One of the tests prescribed in the U. S. P., not only for bismuth, but also for several other metallic salts, directs that after precipitating all of the metal by hydrogen sulfid from acid solution, the filtrate should leave no residue on evaporation. During the continued drought of last summer the atmosphere in my surroundings so abounded in very fine dust, that it was impossible to evaporate even the purest alcohol or distilled water without a residue. After heating over the Bunsen flame on platinum foil they invariably left a very slight yet distinctly visible ring on the polished surface. All of the specimens tested left a similar trace of residue. Having found that this did not necessarily indicate an impurity in the salt, but was due to temporary atmospheric conditions, I disregarded it. On repeating the evaporation during a spell of wet weather, the same distilled water left no stain behind.

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Further Experiments with Wild Cherry Bark.

By *Dr. Alfred R. L. Dohme and Dr. Hermann Engelhardt.*

In a previous publication upon this subject * we stated that we would take up this work on a more extensive scale this winter in order to ascertain if there were any definite or even approximate rule as to the relative yield of hydrocyanic acid contained in the bark of old wild cherry trees, (*i. e.* brown or "rossed" bark) and in the bark of young wild cherry trees, (*i. e.* green or virgin bark). It will we remembered that Prof. A. B. Stevens of Ann Arbor found that the thick brown bark was richest while our results indicated that the thin green bark was richest in hydrocyanic acid. In order to get a more general grasp of the subject, we obtained samples of *Prunus virginiana* from Dr. E. R. Squibb of Brooklyn, Prof. J. U. Lloyd of Cincinnati, and from three firms in the city, Messrs. Muth Bros. & Co., Gilpin, Langdon & Co., and Higgins & Waters. To all of these gentlemen we wish to express our thanks for their courtesy. We at once sent a duplicate set of all of these samples to Prof. Stevens and we await his results with them with interest.

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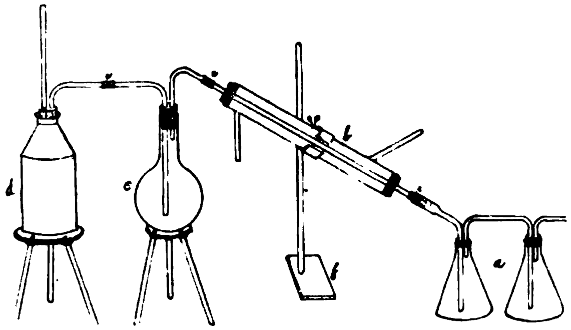
* Amer. Druggist, vol. 27, p. 251, and Phar. Rundschau, vol. 13, p. 260.

Prof. Lloyd's samples were gathered in Ohio, those of Messrs. Higgins & Waters in New York state and the rest in Virginia and other southern states. The samples of Prof. Lloyd possess an additional interest in that they were all taken from one tree and from three parts of it, being (1) Bark of Root, (2) Bark of Tree and (3) Bark of Twigs. The results obtained from them are not, strictly speaking, comparable with the brown and green classification, as the bark of the tree was also green and comparatively thin. We will hence put these in a series for themselves. The common bark sent by Dr. Squibb was old and brown to be sure, but old rather in the sense of having been stored a long time than in having been formed on the tree earlier.

It appears that in copying our results in the article published during the month of November,[*] we got the methods I. and II. mixed. The figures for method I. belong to method II. and vice versa. This has no effect upon the conclusion in reference to the relative value of the two kinds of bark, but reverses the conclusion drawn as to the relative value of the methods employed. There is little difference to be sure in any case between the two methods given, but what difference there is points to the superiority of the titration over the gravimetric method, thus confirming what Prof. Stevens observed in this particular. Besides the fact that it indicates more hydrocyanic acid, the titration method has the double advantage of being more expeditious and much less troublesome. For this reason we have omitted entirely the results obtained by the gravimetric method of weighing the metallic silver which results from heating the silver cyanide in a reducing flame.

Our results, as will be seen below, confirm those we obtained before and indicate that the green thin cherry bark is really richer in hydrocyanic acid than the thick brown bark, thus substantiating the "taste" test; for it is a well-known fact, that the green bark possesses as a rule a stronger and more acid taste than the brown bark. The distillation was carried on as indicated by us in our former paper and we have become convinced that live steam at 100° C. will drive every trace of hydrocyanic acid out of wild cherry bark in less than twenty minutes. Our apparatus used is given in the figure below:—



Distillation.

d is a tin can half filled with water and closed by a two-holed cork supplied with two glass tubes, one of which dips below the surface of the water and the other connects the can with a liter glass Florence flask *c*, through a double-holed rubber stopper. The tube connecting the latter with the can dips below the surface of the liquid in the flask and the other tube in the flask connects it with the long Liebig condenser *b* through which cold water is of course rapidly flowing during the process. The condenser is supported by a stout iron stand *f*, being firmly clamped to the latter by an iron screw clamp. The end of the condenser tube is connected with a small Erlenmeyer flask *a* by means of a glass tube attached to it by a piece of rubber tubing *e*, the glass tube, which is bent, dipping below the solution of caustic alkali contained in the flask. This flask is connected with another similar flask also containing caustic alkali solution and attached merely for safety's sake so as to catch and absorb any hydrocyanic acid that might pass through the first flask undissolved.

The assay is carried on as follows:— 10 grams of wild cherry bark, ground to a No. 40 powder, are allowed to macerate for twenty-four hours with 100 cc. of distilled water in a 250 cc. corked Erlenmeyer flask, shaking frequently. The entire contents are then washed into the liter flask *c* by means of distilled water and the flask *c* then securely corked with the two-holed stopper already described. The water in the can *d* is then heated to boiling and as soon as steam comes over into the flask *c* this is also heated by a Bunsen burner placed under it. Distillation is continued about twenty minutes and the flask *a* then removed as well as the burner under flask *c*. Some of the distillate is then caught up in a clean test tube and the flask *a* again attached to the condenser by means of the rubber tube *e*. To the contents of the test tube a few drops of a solution of a mixture of ferrous and ferric salts are added, the mixture made alkaline with caustic soda until a permanent bluish-green precipitate is formed, and then heated gently. On adding an acid, to acid reaction, a light brown or a light blue color may result; in the former case there is no more hydrocyanic acid present and in the latter case there is still some hydrocyanic acid present. This reaction is capable of detecting hydrocyanic acid in dilutions of one to fifty thousand parts of water.[*]

Titration.

A decinormal solution of silver nitrate is made and a endiometer graduated to tenths of a cubic centimeter filled with it. The contents of both flasks *a* are poured into a large beaker and a decigram of sodium chloride added and dissolved in the liquid. The silver solution is added until a permanent milkiness results, due to the formation of silver chloride. Read off the number of cc. of silver solution used and multiply by two, as half of the potassium cyanide present is used up in dissolving the silver cyanide formed, to form a soluble double salt. From this it is easy to calculate the amount of hydrocyanic acid present. By this method the distillation proceeds under normal pressure, and hence temperature, whereas in Prof. Stevens' method the thistle safety tube introduces a slight pressure resulting in a slightly higher temperature. This may not however affect the result. The main preference of our method with live steam is double saving of time, — first, because it actually occupies one twentieth of the time required to make a complete distillation by Prof. Stevens' method, and second, because one can perform other work while it is going on, while Prof. Stevens' method requires constant watching for several hours.

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[*] Amer. Druggist, vol. 27, (1895), p. 251, and Phar. Rundschau, vol. 13, p. 260.

[*] Beilstein's Handbuch, Bd. I, p. 1411.

Results.

Most of the barks examined are very poor, at least as compared with what we have examined previously, although as before stated, the bark of root of the samples from Prof. Lloyd is normal or rather above the average.

	Thick Brown Wild Cherry Bark.	
1	Squibb—"common bark"...	a—0.0782% HCN. b—0.0831% HCN.
2	Muth—"brown bark".........	a—0.0636% HCN. b—0.0782% HCN.
3	Lloyd—"bark of tree"........	a—0.1760% HCN. b—0.1736% HCN.
4	Higgins & Waters—"rossed bark"...........................	a—0.1565% HCN. b—0.1565% HCN.

	Thin Green Wild Cherry Bark.	
1	Squibb—"young bark"......	0.22% HCN.
2	Muth—"virgin bark".........	0.1418% HCN.
3	G. L. & Co.—"green cherry"	0.1565% HCN.
4	Lloyd—"bark of twigs".....	a—0.115% HCN. b—0.117% HCN.
5	Higgins & Waters—"green cherry".........................	a—0.166% HCN. b—0.167% HCN.

The results obtained gravimetrically, which we have not recorded, agreed with those obtained volumetrically, although in nearly all cases somewhat lower than the latter. We believe this is due to the fact that hydrocyanic acid does not as readily decompose silver nitrate as it does caustic potash and some may be lost on this account. As we cannot recommend the gravimetric process in any particular, and it gives lower results, we have discarded it entirely. As a comparison of the various parts of the tree *Prunus virginiana* we have from Prof. Lloyd's three samples:

Bark of Root of Wild Cherry.....	a—0.3423% HCN. b—0.3423% HCN.
" " Tree " "	a—0.1760% HCN. b—0.1736% HCN.
" " Twigs " "	a—0.1150% HCN. b—0.1170% HCN.

This indicates very strongly that the bark of the root is richer than that of the tree and this in turn richer than that of the twigs.

If we leave out the samples of Prof. Lloyd as not being strictly gathered in accordance with the thick brown and thin green requirement, since both were comparatively thin and green, and also the "common" bark of Dr. Squibb which is hardly a thick brown bark, we must conclude as we did formerly* that the thin green or young bark is richer in hydrocyanic acid than the thick brown or older bark.

The two processes of distillation were tried on the same sample of bark in several cases and never once could we get as much hydrocyanic acid by Prof. Stevens' method as we did by our own, although we distilled the same sample five times as directed by him. We further observed that practically all the acid came over during the first distillation as all that came over during the second distillation required two drops of decinormal silver solution to completely unite with it and all that came over during the third distillation required but one drop of decinormal acid solution. Both of these quantities are practically insignificant. The fourth distillation yielded us no hydrocyanic acid. We hence conclude that the method using live steam besides being simpler and more expeditious is also fully as exact if not more so.

Since this process of assay is so simple and easily manipulated and since the above investigation has shown that the various parts of the plant vary so much in the amount of hydrocyanic acid they contain and since the virtue of wild cherry bark is generally believed to reside in the hydrocyanic acid it contains, does it not seem rational to conclude that a hydrocyanic requirement and a process of assay for *Prunus virginiana* are desirable additions to the United States Pharmacopoeia? Whether or not wild cherry bark is a therapeutically valuable drug is another question and does not concern us, inasmuch as the drug is used to a very large extent and might as well be dispensed of a nearly uniform strength, since this can so readily be ascertained.

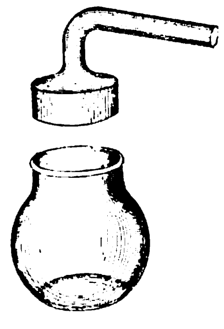
Baltimore, Dec. 17, 1895.

New Laboratory Apparatus.

By *Edward Kremers.*

Combination Weighing and Distilling Flask.

The *Abdampfkolben* or evaporating flasks are very convenient in certain processes of pharmaceutical assaying. When comparatively large quantities of ether or chloroform are used and numerous assays are made they, however, have one disadvantage, viz. that the solvent cannot be recovered. Inasmuch as the etheral or chloroform solutions can just as readily be distilled from a water bath as evaporated, there is no reason why pounds of ether or chloroform should be wasted.



By replacing the ground glass stopper of the evaporating flask by a ground glass still head, the evaporating flask is easily converted into a distilling flask. After the solvent is largely recovered by distillation the residue can be completely dried by removing the still head, placing the flask in a desiccator or continuing the application of heat from a water bath. In some instances it may be desirable to weigh the still head with the flask. In order to do this the tube may be shortened if it is not considered best to use a large bell jar desiccator. When numerous assays are made at one time a battery of condensers and flasks can readily be constructed.

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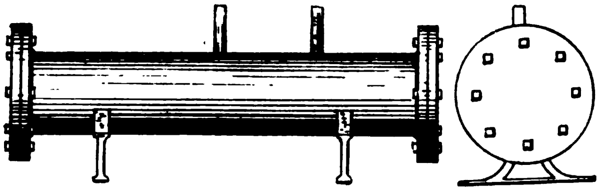
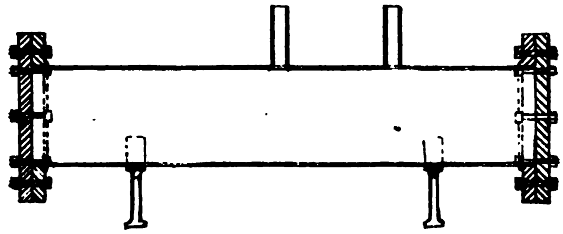
* loc. cit.

Two of these combination distilling and weighing flasks were kindly made upon request by Mr. C. Gerhardt, of Bonn, Germany, at a cost only slightly greater than that of the ordinary evaporating and weighing flask.

Laboratory Still for Tar.

Chemists who have had occasion to distill tar for one purpose or another in organic laboratories with ordinary equipment, no doubt have frequently been perplexed as to how to secure a comparatively cheap, yet efficient still. Glass retorts will not do as a rule on account of the water contained in the tar and the bumping caused thereby. Good copper retorts of satisfactory size are expensive and ofttimes not readily obtainable. A still of wrought iron pipe, however, can be readily made even in small cities. Such a still has given satisfaction during the past year in the distillation of pine tar and for the sake of others may deserve description. Students while working with charges of from 10 to 20 Kg of tar, have not met with a single accident.





This particular still was made of a piece of 8 in. wrought iron pipe, 40 in. long, threaded for an inch at each end. Both ends are fitted with cast iron flanges, 14 in. in diameter and ¾ in. thick. Heads of same diameter and thickness are bolted to the flanges by ⅝ in. × 2 in. bolts. Two 1 inch pipes lead out of the top of the still. One is used as exit tube for the distillate, the other as a safety tube. The still rests upon two cast iron legs, its center being 12 inches above the floor. It is heated by a low gas furnace. Large bottles surrounded by cold water are used as condensers.

MONTHLY REVIEW.

Chemistry.

Preparation of Potassium Ferricyanide.

(G. I. P. No. 81927.)

To a warm concentrated aqueous solution of potassium ferrocyanide C. Bech adds an aqueous solution of ammonium persulphate so that the reduction product will separate upon cooling in the form of a crystalline precipitate of potassium ammonium sulphate.

1 Ko. of potassium ferrocyanide is dissolved in 1 Ko. of hot water and the solution allowed to cool to 60°. To this liquid a cold solution of 270 g. of ammonium persulphate in 500 g. of water is gradually added, the mixture being cooled at the same time. Under these conditions the potassium ammonium sulphate will crystallize whereas the ferricyanide remains in solution.

[Zeitsch. f. angew. Chem., 1895, p. 386.]

Preparation of Sodium Sulphate.

(G. I. P. No. 82443.)

In order to utilize sodium acid sulphat for the manufacture of normal sulphate, according to R. E. Chatfield, a solution of the former is neutralized with an aqueous solution of ammonia (e.g. from gas works), sodium ammonium sulphate resulting. This salt though stable under certain conditions is unstable under others, thus enabling a separation of its dissociated components.

For the conditions under which Na_2SO_4, $Na_2SO_4 . 10H_2O$, $Na(NH_4)SO_4$ and $(NH_4)_2SO_4$ will separate from this solution see the original.

[Zeitsch. f. angew. Chem., 1895, p. 463.]

Preparation of Sodium Bicarbonate.

(G. I. P. No. 81103.)

According to E. Carthaus, magnesia (resp. dolomite) can be brought into solution as magnesium bicarbonate by acting upon it with carbon dioxide and water under a pressure of 5 to 6 atmospheres. If this solution is acted upon by sodium chloride, also under pressure, double decomposition takes place, magnesium chloride and sodium bicarbonate being formed. The latter is largely precipitated, whereas the magnesium chloride, being very soluble, remains in solution. These reactions are repeated separately in suitable apparatus, the materials being forced under pressure from one vessel into the other until the mother-liquid becomes saturated with magnesium chloride. The sodium bicarbonate is washed to remove the impurities of the mother-liquid.

[Zeitsch. f. angew. Chem., 1895, p. 383.]

Preparation of Boric Acid and of Borax.

(G. I. P. No. 81886.)

For the preparation of these chemicals the firm of Bettenhausen, Marquardt & Schulz recommends a modification of patent 72012. If boronatro calcite is boiled with an aqueous solution of sodium bisulphite all boric acid is dissolved in the form of sodium borate, whereas the calcium remains undissolved as sulphite:

$$(Na_2O.2B_2O_3+2CaO.3B_2O_3)+2NaHSO_3 = 2Na_2O.5B_2O_3+2CaSO_3+H_2O.$$

If calcium sulphite is used the reaction is practically the same with but one exception. The calcium of the calcium bisulphite as well as that of the mineral is precipitated as normal sulphite:

$$(Na_2O.2B_2O_3+2CaO.3B_2O_3)+2(CaH_2.2SO_3) = Na_2O.5B_2O_3+4CaSO_3+2H_2O.$$

Pondernute, calcium borate, when treated with sodium acid sulphite yields sodium acid borate:

$$(4CaO.5B_2O_3)+4(NaHSO_3) = (2Na_2O.5B_2O_3) +4CaSO_3+2H_2O.$$

However, when treated with calcium acid sulphite it yields free boric acid:

$$(4CaO.5B_2O_3)+4(CaH_2.2SO_3)+11H_2O = 8CaSO_3+10B(OH)_3.$$

For quantities to be used and conditions to be observed see the original.

[Zeitsch. f. angew. Chem., 1895, p. 385.]

Preparation of Potassium Chlorate.

(G. I. P. No. 81804.)

R. J. Bayer recommends the use of zinc oxide in place of lime or magnesia, because the first mentioned yields a more valuable by-product, viz. zinc chloride. The mixture of water, levigated zinc oxide (3 equivalents) and potassium chloride (1 equivalent), previously heated to a temperature of 95 to 98° in order to avoid the separation of zinc oxychloride, is saturated with chlorine. A variety of conditions must be observed to avoid the formation of undesirable products. The potassium chlorate is readily obtained by crystallization. The zinc chloride is obtained by evaporation of the mother-liquid. If a slight contamination of the zinc chloride with potassium chlorate is undesirable the latter is decomposed with an equivalent quantity of hydrochloric acid. The chlorine thus eliberated can be used in saturating fresh lots of original mixture.

[Zeitsch. f. angew. Chem., 1895, p. 386.]

Isolation of Chlorine from Gas Mixtures.

(G. I. P. No. 82437.)

According to H. Loesner, chlorine can be isolated from mixtures, such as that resulting from the Deacon process, by passing the gases through liquids that absorb chlorine but are not affected by the same. o-Nitro toluene is especially recommended for this purpose. Under ordinary pressure it absorbs as much as 11 p. c. and more. The chlorine is again given off upon application of heat or reduction of pressure. It is not necessary to employ c. p. o-nitro toluene.

Nitro benzene, the nitro xylenes, the nitro cumenes, benzene chloride or bromide, toluene chloride or bromide, chloroform, tetrachlor carbon, monochlor ethyl acetate or liquid paraffins can also be used in place of o-nitro toluene. Solids, such as p-nitro toluene, benzene dichloride, dibromide, trichloride, tribromide, the corresponding toluene derivatives and other solid compounds do not absorb chlorine at ordinary temperature.

In order to isolate the chlorine from a mixture the latter is poured through one of the above mentioned solvents, keeping the same cool. From the solution thus obtained pure chlorine can be liberated upon heating or diminution of pressure. The eliberated gas can be compressed or used otherwise.

[Zeitsch. f. angew. Chem., 1895, p. 456.]

Preparation of Alkali Phosphates.

(G. I. P. No. 82460.)

For the preparation of sodium and potassium phosphate R. Holverscheit has had the following process patented. Tricalcium phosphate is heated with a solution of alcali sulphate, the phosphate of the alkali formed by double decomposition going into solution. The tetra-basic calcium phosphate of the "Thomasschaelke" cannot be used. It is necessary to use more than the equivalent amount of alcali sulphide. The yield is furthermore increased by heating the mixture to 150° under pressure.

The process can be modified so that the calcium phosphate is fused with carbon and an excess of alkali sulphate. The fused mass is lixiviated. If sodium sulphide or sulphate have been used the sodium phosphate resulting can be obtained by crystallization. The excess of sodium sulphide in the mother-liquid is recovered by evaporation and used again, or can be converted into the carbonate with the aid of carbon dioxide.

The potassium phosphate which does not crystallize is freed from potassium sulphide by the addition of phosphoric acid, or by converting the sulphide into the sulphate or carbonate and removing then by crystallization.

The residue after lixiviation consists largely of carbon, calcium sulphide and a small quantity of undecomposed calcium phosphate. By exposing this mixture to the air the sulphide is oxidized to hyposulphite. The latter is lixiviated and with the aid of sodium sulphate is converted into sodium hyposulphite. The residual mixture of carbon, gypsum and calcium phosphate is used either as fertilizer or for the preparation of phosphoric acid.

[Zeitsch. f. angew. Chem., 1895, p. 462.]

The Occurrence of Nitrogen in Mineral Springs.

According to Prof. Erdmann the thermal springs of Bath, England, and of Talouko, Asia Minor, also the springs of Petersdorf near Vienna and of Klein-Ragoczy a. d. Saale exhale almost pure nitrogen. To this short list Dr. Cobolet adds one more, viz. the saline spring near Süll-dorf, a small town near the railroad station Osterweddingen on the division Blumenburg-Magdeburg. A sample of water taken from the spring in March contained 4.30 p. c. NaCl, 0.14 p. c. KCl, 0.11 p. c. $MgCl_2$ and 0.13 p. c. $CaSO_4$. In May a sample taken from the spring contained 4.93 p. c. NaCl. The percentage of the other solid constituents was correspondingly higher.

The amount of gas escaping is small. Twelve litres were collected in about 2¼ hrs. The gas is almost free from oxygen, completely free from hydrocarbons and contains 0.25 to 0.3 p. c. of carbon dioxide. The nitrogen constituting the bulk of the gas was further identified as magnesium nitride.

The presence or absence of argon was not ascertained. On account of the greater solubility of argon in water the gas would most likely contain very little of the same.

[Zeitschr. f. angew. Chem., 1895, p. 400.]

Preparation of Potassium Ferrocyanide.

(G. I. P. No. 82081.)

When sulphocyanides of the alkalis are fused with iron, potassium cyanide and ferrous sulphide are apparently formed:

$$6KSCN+6Fe = 6KCN.6FeS.$$

Heretofore this fused mass was lixiviated with water shortly after cooling, whereby a chemical change took place expressed by the following equation:

$$6KCN.6FeS+3H_2O = K_4Fe(CN)_6.3H_2O+K_2S+5FeS.$$

The sulphur of the residual ferrous sulphide is thus largely wasted, for if exposed to the air the sulphide is converted into oxysulphate of iron, which is but sparingly soluble. Only traces of free sulphur (about 0.3 p. c.) are formed. The residue therefore is worthless and accumulates.

This process has been modified by Goerlich and Hichmann so that the entire amount of sulphur is recovered in the free state. Instead of treating the fused mass immediately with water, it is first exposed to the action of atmospheric air, which contains besides the oxygen the necessary moisture and carbon dioxide to convert the alcali sulphide into carbonate. The fused mass undergoes decomposition according to the following equation:

$$2(6KCN.6FeS)+17O+21H_2O+2CO_2 = 2[K_4Fe(CN)_6.3H_2O]+2K_2CO_3+5Fe_2(OH)_6+12S.$$

In the absence of carbon dioxide the change is substantially expressed by the following equation:

$$2(6KCN.6FeS)+15O+21H_2O = 2[K_4Fe(CN)_6 .3H_2O]+2K_2S+5Fe_2(OH)_6+10S.$$

The formation of alcali carbonate, however, is preferable to that of alcali sulphide. From the oxidized mass the salts and sulphur are extracted according to generally known methods. The residue can be employed in the manufacture of metallic iron.

[Zeitsch. f. angew. Chem. 1895, p. 462.]

Oxidation of Tannic Acid to Oxalic Acid.

L. Fajans, of Budapest, has oxidized tannic acid with various oxidizing agents and has in most instances obtained oxalic acid. Under certain conditions the yield of oxalic acid is so large that it seems possible to devise a method whereby tannic acid can be determined quantitatively by means of this its oxidation product. Nitric acid of 35° Bé. at a temperature of 15° has thus far given the best results. However, gallic acid is also oxidized to oxalic acid by the same agent.

Potassium chlorate and hydrochloric acid, which oxidize tannic acid to oxalic acid, convert gallic acid into intrichlorglycerine acid, $C_3H_3Cl_3O_4$. Acid permanganate, as is generally known, destroys tannic acid.

Oxalic acid also results in alkaline solution, e. g. with potassium ferricyanide and sodium peroxide.

In one experiment, in which a drop of water was added to an intimate mixture of 0.3 g. tannin and an equal amount of sodium peroxide, a violent explosion took place with the appearance of fire.

[Zeitsch. f. angew. Chem., 1895, p. 471.]

Practical Pharmacy.

Separation of Wool Fat into Cholain, Cholepalmin and Cholecerin.

(G. I. P. No. 81552.)

Melted wool fat is allowed to cool gradually to a temperature of 35°. The liquid portion is separated from the solid by expression or with the aid of a centrifuge. The same process is repeated at 40—45°, at which temperature another portion of wool fat is separated. The substances thus obtained are cholain, melting at 25—29°; cholepalmin, melting at 37—28°; and the residual cholecerin, melting at from 49—55°. The cholecerin, which contains most of the cholesterin of the wool fat, has the consistency of wax and can be used as a substitute for the same. Cholepalmin upon saponification yields fatty acids and can be used in the manufacture of candles and soaps, whereas cholain is a good lubricant.

[Zeitsch. f. angew. Chem., 1895, p. 376.]

Adulteration of Tannin.

In an article read before the German Pharmaceutical Society, F. Guenther calls attention to the fact that tannin is not only adulterated with dextrin and sugar; but that the cheaper varieties sometimes contain starch or flour, which are readily identified with the aid of the microscope. He also claims that one brand marked chemically pure, has for a number of years been grossly adulterated with sodium chloride. He has found as much as 13 to 20% of common salt. Epsom salts is said to be used for the same purpose.

[Ber. d. pharm. Gesellsch., 1895, p. 299.]

Food Stuffs.

Weighting and Conservation of Coffee.

According to A. Stutzer coffee is weightened most commonly with sugar, glucose and other materials being more seldom used. Originally the object in adding these materials probably was to preserve the coffee. In the process of roasting the gases generated create pores. In order to close these openings a small amount of sugar was added. If these pores are not closed a fatty oil exudes after a short time, which is affected by the atmospheric oxygen, thus causing a deterioration in the taste of the roasted bean. The temptation, however, soon arose to add more cheap sugar to expensive coffee than was necessary for mere preservation. The public soon accustomed itself to the taste of burnt sugar, housekeepers favored this increased addition, rejoicing over the darker color and better yield of the coffee, without considering that these qualities were to be attributed to a much cheaper substitution paid for at the rate of roasted coffee. As much as 15 p. c. of sugar was added to the crude coffee and at times even more. Besides, the coating of caramel concealed the externally recognizable properties of a poor bean. To the unscrupulous, troublesome sorting became unnecessary and some did not hesitate to sell a cheap Brazilian coffee with this dark coating as fine Java.

Inasmuch as it was difficult to determine how much sugar was necessary for preservation, the sanitary police had difficulty in prosecuting the culprits. A union of wholesale dealers in Germany has adopted the following rule for its guidance.

Every weighting of coffee is to be avoided. Small additions of foreign substance for the sake of preservation are to be permissible, but such additions are not to exceed 1 p. c. of the crude coffee. The outward appearance should not be changed by such addition, so that the purchaser may be enabled to readily recognize a poor or unripe bean.

For the sake of preservation an extract prepared from the fresh pulp of the coffee fruit is recommended. Inasmuch as this is expensive it cannot be used for weighting of the roasted bean. This extract was first examined by Dr. Kayser-Nürnberg, who found traces of caffeine and appreciable quantities of coffeotannic acid. The latter is generally considered to be the mother substance of the aromatic principles of roasted coffee. The results of Kayser have been verified by Stutzer, at least as to caffeotannic acid. The addition of 0.5 Ko. of this extract to 62.5 Ko. of crude coffee in no way interferes with the external characteristics of the bean. That such small quantities of extract really have a preservative influence was determined by a comparison after several weeks' standing.

[Zeitsch. f. angew. Chem., 1895, p. 449.]

Examination of Coffee with Reference to the Yield of Fat, Sugar, and Coffeotannic Acid.

By E. HERFELDT and A. STUTZER.

Fat. Apparently only few observations have been made with regard to the nature of the fat from the coffee beans. According to the older investigations of Rochleder the fat consists primarily of glyceryl palmitate, whereas A. Hilger has recently pointed out that it consists almost entirely of the glycerin oleate with traces of oleic acid.

Proximate analyses were made of three varieties of coffee, viz. Santos, New Granada, and Java.

125 lbs. of green Santos containing 10.18 lbs. fat yielded 102 lbs. roasted coffee containing 16.91 lbs. fat: increase 6.73 lbs. or 66 p. c.

125 lbs. crude New Granada containing 16.37 lbs. fat yielded 102.5 lbs. roasted coffee containing 15.82 lbs. fat: loss 0.55 lbs. or 3 p. c.

125 lbs. crude Java containing 17.50 lbs. fat yielded 102 lbs. roasted coffee containing 11.52 lbs. fat: loss 5.98 lbs. or 33 p. c.

These figures are very striking and the interesting question at once arises, from which constituents does the Santos produce the large amount of fat upon roasting. On the other hand the reduction of fat in the Java, having undergone like treatment, is considerable. Another question of interest is what influence does the fat exert on the quality of the coffee.

Sugar. It is generally accepted that free sugar does not exist in the crude, unroasted coffee. Only J. Bell claims to have found a substance related to cane sugar. The authors test coffee for sugar with Fehling's solution and find none. (However, judging from the methods employed their testimony is of rather questionable character. *E. K.*) The sugar present in roasted coffee is supposed to be a decomposition product of coffeotannic acid, a glucoside.

Coffeotannic Acid. Inasmuch as the intensity of the aroma of roasted coffee is supposed to stand in some relation to the percentage of coffeotannic acid in the green bean, the quantitative estimation of this acid is naturally an interesting problem. Several processes were tried (see original), but no satisfactory results were obtained.

[Zeitsch. f. angew. Chem., 1895, p. 469.]

Pharmacognosy.

Cultivation of Camphor Trees in India.

Plans are being laid to attempt the cultivation of the camphor tree not only on the island of Ceylon but also in the cooler valleys and gorges of the mountainous regions of India. It is shown from historical evidence that this tree was found in former times in Nepal and in the earlier kingdom of Tipra on the upper Irawaddy, and as late as the present century camphor was exported from Chittagong. It is probable that when the natives learned the secret of obtaining and making use of camphor, these trees were completely swept away.

In the government cinchona plantations on the northern slope of the Himalayas in Sikkim and Nimborg, 100,000,000 plants are already flourishing.

[Apotheker Zeitung, 10, (1895), p. 768.]

Guttapercha from Leaves.

So far as known, guttapercha has up to the present time been obtained only by the tapping of those trees which yield the caoutchouc-containing sap. Since after the trunk has been thus bored several times the tree dies, this method threatens with extinction the rubber-producing forests. A Dutch chemist has, however, found that not only the bark of the tree contains the sought-for sap but also the leaves, and in relatively larger quantities than the stem. Consequently in certain plantations only the foliage of the trees is used in obtaining guttapercha. Since the leaves may without injury to the tree be removed twice a year, the natives gather and dry them and send them by the shipload to France where they are extracted with carbon bisulphide, giving a much purer article than by the usual process. If this practice becomes general, a decline in the price of guttapercha may be expected.

[Apotheker Zeitung, 10, (1895), p. 769.]

The Poisonous Action of the Manzanilla Tree.

The caustic and toxic action of the West Indian Euphorbia, *Hippomane manzanilla*, have been long known and have frequently been overdrawn in descriptions. According to Gazeau and Reboul, action at a distance is entirely out of the question or only possible when rainwater from the leaves of the tree fall on the unprotected skin of one standing under it. Pustular eruptions are then formed as is seen to follow the direct contact of the milky juice with the skin. When taken internally, the juice causes symptoms of poisoning in the alimentary canal similar to *Croton Tiglium.* For the treatment of poisoning by the manzanilla, sea water used both externally and internally is recommended. [Repert. Pharm. 51, (1895), p. 465; and Chemiker Zeitung, 19, (1895), p. 340.]

Bacteriology.

The Action of Saprophytic Bacteria on the Toxic Activity of Strychnine.

In order to learn the action of certain saprophytes isolated from human corpses (of wounded individuals), Prof. S. Ottolenghi tried first such dilute solutions of alkaloids in sterilized bouillon, as, when given in definite quantities, were able to call forth the first symptoms of poisoning in animals. The solutions were divided into equal parts, brought into small glass globes (Kugeln), and after inoculating each with one of the various kinds of fresh saprophytes were placed in a thermostat having a temperature of 35°. The loss by evaporation was made up each day by the addition of sterilized bouillon. The toxic strength of the cultures was then tested daily.

In the experiments made with strychnine, *B. liquefaciens putridus*, *B. subtilis*, *B. mesentericus* and *B. coli* were introduced into bouillon. In one culture, a part of the bouillon was replaced by definite amounts of strychnine, in the other not. Both were placed in the incubator and tested daily for toxic activity. He found that in the first days the organisms developed in the strychnine-containing bouillon brought about a strong increase in the toxic activity of the alkaloid. During the succeeding time, it was diminished; on the

34th day it had sunk to the half, and on the 77th was but one-third of its original intensity. Since new tetanic substances are not formed by the poisons eliminated by the bacteria, nor by the dead bodies of the organisms, nor by the disorganized proteid substances of the culture medium, as was shown by the cultures containing no alkaloid, Prof. Ottolenghi believes the increase in the toxic activity of the strychnine during the first few days can be explained in the following way. The toxines formed by the bacteria in the medium when injected fresh into the animals have the effect of weakening them and making them more sensitive to the action of the alkaloid. The increase in toxic activity is, therefore, only apparent. The weakening of the poison, he believes, can be attributed to a consumption or a neutralization of a part of the alkaloid, since the animals used in the experiments showed no pathological symptoms along with the weakening of the tetanic phenomena which could be ascribed to other bacteriological intoxication.

[Centralblatt für Bacteriologie, 18, p. 270; and Apotheker Zeitung, 10, (1895), p. 768.]

Pharmaceutical Societies.

Second International Pharmaceutical Exposition.

The Pharmaceutical Society of Prague has decided to arrange a second international pharmaceutical exposition in August, 1896, at the time of the celebration of its twenty-fifth anniversary. The first exposition of this kind was held in Vienna in 1883.

The Swedish Apothecaries' Society and Bacteriology.

The Swedish Pharmaceutical Society at its Stockholm meeting has voted about $850.00 for the equipment of a bacteriological laboratory in connection with the Pharmaceutical Institute. This institute was founded by the Apothecaries' Society and with its laboratories and collections turned over to the state, which now has charge of and maintains the same. The society also provides the rooms for the new laboratory.

The General Austrian Apothecaries' Society

has received a donation of 40,000 Gulden for the maintainance of its collections and general educational equipment.

Universities and Colleges.

The Chicago College of Pharmacy

has tendered its building and entire equipment to the University of Illinois at Champaign. If accepted the college is to become a department of the university, but is to retain its location in Chicago. It may not be generally known that the University of Illinois has maintained a department of pharmacy at Champaign for several years. The developments will, therefore, be watched with double interest.

In Memoriam.

Dr. Richard Godefroy, Professor of Chemistry at the Technical and Industrial Institute at Vienna, died October 22, 1895. Godefroy was born at Vienna, August 26, 1847. He obtained a good preliminary education at the *Schotten-Gymnasium* at Vienna, was then apprenticed to an apothecary and subsequently studied pharmacy at the university of Vienna. After graduating as Ph. D., Dr. Godefroy accepted a position as assistant to Prof. Redtenbacher, but entered in 1871 upon the position of instructor at the Pharmaceutical Institute of the Austrian Apothecaries' Association in Vienna, which position he filled with much success until 1888. He added to this institute an analytical and research laboratory. During those 18 years many of the present younger generation of Austrian pharmacists have obtained their pharmaceutical instruction and the foundation for their subsequent proficiency under the guidance of the efficient instructor of the Pharmaceutical Institute.

In 1879 Dr. Godefroy accepted the additional position of instructor in technical chemistry at the Industrial Institute at Vienna, which position was raised to a full professorship in 1888, when he resigned the position of pharmaceutical instructor.

Dr. Godefroy has been for many years one of the foremost representatives of Austrian pharmacy. He also acted as juror at the International Exhibitions in Paris, Amsterdam, and Antwerp. He was an honorary member of the Austrian Apothecaries' Association and of the pharmaceutical societies of Brussels, Antwerp, Warschau, and Bukarest.

Prof. Godefroy was an excellent lecturer and skilled analyst. The number of his published analytical reports is large; he also has published several chemical text-books, among them in 1882 a Compend of Pharmacy in two volumes. In the death of Dr. Godefroy Austrian pharmacy has lost one of its foremost scholars, writers, and former professors, whose memory will be dear to the living generation of pharmacists. *Fr. H.*

Literary.

Books and Pamphlets Received.

P. Blakiston, Son & Co.—Philadelphia. Handbook of Pharmacy, embracing the theory and practice of pharmacy and the art of dispensing. By Dr. Virgil Coblentz, Professor of Pharmacy and Pharmaceutical Chemistry in the College of Pharmacy of the City of New York. 2nd Edition, revised and enlarged. One vol., pp. 572, with 437 illustrations. 1895. $3.50.

——The Art of Compounding. A text book for students and a reference book for pharmacists at the prescription counter. By Wilbur L. Scoville, Professor of Applied Pharmacy in the Massachusetts College of Pharmacy. One vol., pp. 264. 1895. $2.50.

——Outlines of Materia Medica and Pharmacology. A text book for students. By H. M. Bracken, M. D., Professor of Materia Medica and Therapeutics, University of Minnesota. One vol., pp. 283. 1895. $2.75.

——Quiz-Compend of Pharmacy. By F. E. Stewart. 5th revised edition. One vol., pp. 187. 1895. 80 cents.

Author—Cincinnati. Etidorhpa; or The End of Earth: the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. Author's edition, limited. One vol., pp. 376. 1895.

Ferdinand Enke—Stuttgart. Einführung in das Studium der Bacteriologie und Anleitung zu bacteriologischen Untersuchungen für Nahrungsmittel-chemiker. Von Dr. A. Stavenhagen, Privatdocent für Bacteriologie an der Kgl. technischen Hochschule zu Berlin. Mit 83 in den Text eingedruckten Abbildungen. 1895. M. 4.00.

Wilhelm Engelmann—Leipzig. Anleitung zur Molekulargewichtsbestimmung nach der "Beckmannschen" Gefrier- und Siedepunktsmethode. Von Dr. phil. Gotthold Fuchs, Assistent am Laboratorium für angewandte Chemie der königlich bayrischen Friedrich-Alexanders-Universität zu Erlangen. Mit 18 Textfiguren. 1895. M. 1.20.

C. W. Kreidel—Wiesbaden. Beiträge zur Reinisolirung, quantitativen Trennung und chemischen Charakteristik von Alkaloiden und glycosidartigen Körpern in forensen Fällen, mit besonderer Rücksicht auf den Nachweis derselben in verwesenden Cadavern. Von Dr. Carl Kippenberger, Privatdocenten am eidgenössischen Polytechnikum in Zürich. 1895, pp. 58.

H. Heyfelder—Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie. Herausgegeben von Dr. Emil Jacobsen. 1895. Erstes Halbjahr. 1te Hälfte. Mit Textabbildungen. 1896.

Chr. H. Tauchnitz—Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tsirch und Dr. O. Oesterle. Lief. 9, 1895.

Henry Holt & Co.—New York. A Dictionary of Botanical Terms. By A. A. Crozier. One vol., pp. 202. $2.75.

Deutsche Verlags-Anstalt—Stuttgart. Lexicon der gesammten Technik und ihrer Hilfswissenschaften. Von Dr. O. Lueger. Abtheilung 10. Schluss des ersten Bandes. pp. 641—800.

C. W. Kreidel—Wiesbaden. Erläuterungen zur qualitativen Analyse anorganischer Körper. In Bezug auf die practischen Hilfsmitttel und den planmässigen Gang derselben. Von Dr. Alex. Spraul. Ein Bd. 173 S. mit 50 Textabbildungen. 1896. $1.25.

Julius Springer—Berlin. Commentar zum Arzneibuch für das Deutsche Reich. Herausgegeben von H. Hager, B. Fischer und C. Hartwich. Zweite Auflage in 2 Bänden, mit zahlreichen Textabbildungen. Zweiter Bd., erste Hälfte. 384 S. 1895.

Julius Springer—Berlin. Pharmaceutischer Kalender für 1896. Zwei Bde. $1.10.

Bibliographisches Institut—Leipzig. Conversations-Lexicon. Band 10. 1895.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome premier. A—B. Avec gravures dans le texte. 1895. Abasie-Astasie—Aliments. pp. 336.

Author—Madison, Wis. On the Influence of Sudden Changes of Turgor and of Temperature on Growth. By Dr. Rodney H. True. 1885. pp. 38.

Author—On Complex Tartrates and certain Alkaline Solutions of Copper and of Lead. By Dr. Louis Kahlenberg. 1895.

C. Winters Verlag — Heidelberg. — Probleme der Atomistik. Vortrag auf der 67. Jahresversammlung Deutscher Naturforscher und Aerzte. Von Dr. Victor Meyer, Professor der Chemie an der Universität Heidelberg. Ein Heft, 45 S. 1895.

Leopold Voss—Hamburg. Anleitung zur microchemischen Analyse der wichtigsten organischen Verbindungen. Von Dr. H. Behrens. Erstes Heft. 64 S. mit 49 Textabbildungen. 1895. 65 cents.

W. Engelmann—Leipzig. Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigsten Arten. Von A. Engler. Lief. 123—125.

U. S. Department of Agriculture—Washington. Forestry for Farmers. By B. E. Fernow, Chief of Division of Forestry. Pamph., pp. 40. 1895.

Schimmel & Co.—Leipzig. Handelsbericht. October, 1895.

Schimmel & Co.—Leipzig and New York. Semi-annual Report. October, 1895. pp. 78.

L. Bergmann & Co.—Wien. Ueber den therapeutischen Werth des Ferratins. Von Dr. Richard Deutsch, Assistent der I. med. Abtheilung im k. k. Krankenhause Rudolph-Stiftung. 1895. pp. 8.

Wilhelm Braumüller — Wien. Neue Vorschläge zur Prophylaxis und Therapie der Diphtherie. Theoretisch und praktisch begründet von Dr. S. Schwarz, Constantinopel. Sep.-Abdruck aus der Wiener klin. Wochenschrift Nr. 43, 1895. pp. 11.

Lehn & Fink—New York. Antitoxines, vaccine virus, and other Biological Products. From the biological and vaccinal department of the New York Pasteur Institute. 1895. pp. 28.

Armour & Co.—Chicago. Influence of the Thyroid Gland on Nutrition. The Treatment of Goitre, etc., by Dessiccated Thyroids. On Internal Secretions. 1895. pp. 23.

Reviews.

Handbook of Pharmacy, embracing the theory and practice of pharmacy and the art of dispensing. By Dr. Virgil Coblentz, Prof. of Pharmacy and Pharmaceutical Chemistry in the College of Pharmacy of the City of New York. 2nd Edition, revised and enlarged. One vol., pp. 572, with 437 illustrations. Publ. by P. Blakiston, Son & Co. in Philadelphia, 1895. $3.50.

The first edition of this work has been commented upon on p. 295, Vol. 12 of the Rundschau, doing full justice to the general character and value of the elaborate work. The second edition has received a number of corrections and slight alterations and the main omissions pointed out in the previous review have been supplied by the addition of the two new chapters on "Urine and its analysis" and "The application of the microscope in pharmacy," the former one compiled by Dr. G. C. Diekman, the latter by Dr. S. E. Jelliffe. Both these new chapters are on pertinent and most interesting subjects. They are well written, especially the one on urine and its analysis, and they enhance the value and usefulness of the book to the practitioner of pharmacy.

The Handbook is well adapted as a textbook for our students of pharmacy as well as a reference book for the practice of pharmacy; its excellencies far overbalance its few short-comings and omissions. Among the latter may be mentioned the desirable introduction of a chapter on the valuation or estimation of alkaloidal galenical preparations, a subject of constantly increasing importance in manufacturing and dispensing pharmacy. Although still in a state of evolution and imperfection, several methods of considerable value for the identification and estimation of drugs as well as of their fluid extracts and tinctures have been established during recent years. The importance of the application of pharmaceutical research in this direction and of the valuation of the therapeutical constants of important plant remedies is now of such a recognized prominence that it is one of the foremost problems in pharmacy. It is sufficiently advanced to be recognized and incorporated among other unsettled yet progressive subjects in pharmacy.

The book is a credit to its author and publisher and will remain an active factor in the advancement and the application of pharmacy in its duality as an art and a science. *Fr. H.*

The Art of Compounding. A textbook for students and a reference book for pharmacists at the prescription counter. By Wilbur L. Scoville, Professor of Applied Pharmacy in the Massachusetts College of Pharmacy. One vol., pp. 264. P. Blakiston, Son & Co. Philadelphia, 1895. $2.50.

Although the principal textbooks on the practice of pharmacy have given due consideration and space to what still remains the foremost province of the practice of legitimate pharmacy, the art of dispensing, Prof. Scoville has deemed it timely and expedient still more to enlarge upon this domain. He may have done this in order to signalize and to outline once more the true domain of legitimate pharmacy, as against the encroachments and the intrusion of industrial enterprise and the advantages of manufacturing on a large scale, and also to offer to the pharmaceutical practitioner a more elaborate and special reference book both for practice and for authoritative information and protection in questionable cases. In both these relations the author has succeeded well and the book will prove a useful addition to the handbooks of the practice of pharmacy.

The additional name of a text-book for college students seems to us, however, not quite in place. The art of dispensing is so much a handicraft based on practical skill and experience as well as on knowledge, that not the lecture room, but the prescription counter is the proper and almost exclusive place to learn and to master the art of dispensing. And there this handbook will serve as a useful and instructive guide to the learner and as a mentor to the more proficient practitioner.

The few omissions and the elimination of some errors and superfluous ballast will probably be taken into consideration by the author when revising the book for a new edition. It will nevertheless serve its purpose well and retain a deserved place in our pharmaceutical literature. *Fr. H.*

Beiträge zur Reinisolirung, quantitativen Trennung und chemischen Charakteristik von Alkaloiden und glycosidartigen Körpern in forensen Fällen, mit besonderer Rücksicht auf den Nachweis derselben in verwesenden Cadavern. Von Dr. Carl Kippenberger, Privatdocenten am eidgenössischen Polytechnikum in Zürich. C. W. Kreidel's Verlag, Wiesbaden, 1895.

In no department of analytical chemistry is new light more needed and more welcome than in that of forensic chemistry. The isolation of inorganic poisons from the cadaver is a comparatively easy matter when compared with the detection and isolation of organic poisons. Not only are the host of so-called new remedies adding to the complexity of this branch of chemical analysis, but the so-called ptomaines haunt the mind of the forensic chemist with their mock semblance to alkaloids. Furthermore, the forensic chemist has not only to deal with cases of accidental poisoning and intentional suicide, but at times with the victims of ingenious murderers. With the general advance of chemical knowledge matters seem to have become more complicated rather than simplified.

A method of forensic analysis, which will from the very beginning separate the plant alkaloids from those decomposition products of the decaying body producing similar reactions, must therefore be considered a good step in advance over the older methods of Stass-Otto, Dragendorff and others. This great advantage is claimed for glycero-tannic acid as a menstrum for extraction, although the author is aware that alkaloids and ptomaines are not chemical terms in a very strict sense. A number of minor improvements are also discussed: e. g. the conversion of a caustic alkaline solution into an alkali carbonate solution by means of the addition of bicarbonate, thus enabling the substitution of chloroform alcohol or chloroform ether for the objectionable amyl alcohol.

The general tone of the work suggests the skillful and ingenious analyst. Although the new method and minor improvements have been tested in various directions, time alone and extensive application under greatly varied conditions can give that assurance of accuracy which a forensic system of analysis demands.

The brochure is evidently an exact reprint from the Zeitschrift für analytische Chemie, 1895, p. 294.

E. K.

Einführung in das Studium der Bacteriologie und Anleitung zu bacteriologischen Untersuchungen für Nahrungsmittel-chemiker; von Dr. A. Stavenhagen, Privatdocent für Bacteriologie an der kgl. technischen Hochschule zu Berlin. Verlag von Ferdinand Enke in Stuttgart. 1895. M. 4.

Bacteriology has for many years been so closely affiliated with medicine that this relation is usually regarded as the most common one. Most of the text books on the subject have been written by medical men, from a medical standpoint and for a medical constituency. The domain of the science is, however, gradually spreading beyond the limits of pathology and disease, and this new tendency is shown in the appearance of text books in dairy bacteriology and the above lines of activity.

The above brochure of 178 pages is intended to serve as a technical guide to the bacteriological work that is often required of the chemist who is concerned with the examination of food stuffs, etc. From this standpoint, the book fills a new place and fills it well. It is divided into a general and an applied part, the first giving in a compact form the essentials of morphology and physiology together with methods of observation and culture. The applied part takes up the technique of the examination of water, soil, air, and the different food stuffs, including the testing of wines, beers, and mineral waters. As a rule, the general technique of the science is brought down to date, although the antiquated methods of agar preparation and hardening Esmarch gelatin roll cultures in ice water are now superseded by shorter and more convenient methods. A few errors in fact have crept in, such as on page 6 where the optimum temperature of growth for most bacteria is given as between 15—20° C. instead of 25—30° C. The subject-matter is well arranged in a topical manner, copious literature references being given at frequent intervals.

The book on the whole is very acceptable and ought to fill a prominent place in the line of work for which it is intended. Even the general student in bacteriology will find in its pages much that will be helpful to him in his work.

H. L. Russell.

Molekulargewichts-Bestimmung nach der Beckmannschen Gefrier- und Siedepunktsmethode. Von Gotthold Fuchs. Verlag von W. Engelmann, Leipzig, 1895. pp. 40.

This treatise is intended to direct students how to use Beckmann's apparatus in determining molecular weights according to the freezing- and boiling-point methods. In addition to a detailed description of the various forms of Beckmann's freezing- and boiling-point apparatus and the directions for using the same, the author gives briefly the theoretical considerations upon which these methods for determining molecular weights are based. The book contains a table giving the molecular lowering of the freezing-point for twenty-eight different solvents as calculated from the latent heat of fusion according to the formula

$$K = \frac{0.02T^2}{w}.$$

There is also a table containing the molecular elevation of the boiling-point for thirty-four different solvents as calculated from the latent heat of evaporation, according to the formula

$$K = \frac{0.02T^2}{w}$$

and also as deduced according to the formula of Schiff and Trouton, $K = 0.00096T.M.$ Tables and curves showing results actually obtained in determining molecular weights of various substances in different solvents according to the two methods are given, and the anomalies that have presented themselves are discussed. With a few exceptions, the author gives references to literature only in a very general way, not citing number of volume and page.

The book contains little that cannot be found in the literature and in laboratory guides on physico-chemical measurements; at the same time, it will not be unwelcome as it contains in compact form the salient facts that the student needs to know in order to make determinations of molecular weights according to these methods, intelligently and accurately.

Louis Kahlenberg.

Etidorhpa; or The End of Earth; the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. [By John Uri Lloyd.] Published by the author, Cincinnati, 1895.

Ever since modern science began its rapid development there have been those who claimed that it would some day furnish the chief inspiration to literature. Most of those who have theorized on the subject have written on science and poetry; but the practical attempts to effect a combination have been mainly in the domain of fiction. The authors of these so-called scientific stories have, however, rarely been either scientists or men of letters. Their object has been to vivify a didactic essay by means of narrative, like Peter Parley; or, like Jules Verne, to overcome prejudice against the novel in general, by representing that their nonsense is really instructive. It is therefore something of a novelty to find a man of established scientific reputation issuing a work of this kind.

The author of Etidorhpa has adopted this literary form to put forward, not definite teachings, but unverified speculations, many of which are on the borderland between physics and metaphysics. At the outset the reader is asked not to "attempt to differentiate between history and romance, fact and fancy, speculation and science, sarcasm, ignorance and irony." It may be doubted whether this request is one that an author has the right to make. But it serves to call attention to the fact that the story is not didactic, but suggestive. This fact is also emphasized by the form of the work. The device of claiming to be only the editor of a manuscript has been frequently adopted. Prof. Lloyd goes one step further, and by posing simply as the executor of an editor reminds the reader still more forcibly that he wishes to escape the consequences of dogmatic criticism.

Viewed simply as a work of fiction, Etidorhpa should be welcomed by those who believe in the ultimate union of science and literature. It is the work of a scientist rather than a man of letters; and from this fact come its greatest faults and its greatest excellencies. Undoubtedly there are some blemishes which a more practiced literary worker would have removed. The pen that describes natural phenomena so vividly and picturesquely gives but a painful jumble of adjectives when it attempts to portray the beauties of Etidorhpa (p. 259); and the impartial reader is likely to wonder if the reference to vivisection may not have been forcibly introduced, and the chapters on drunkenness unduly prolonged, to point a moral at the expense of art.

But the faults, taken at their worst, are trivial, and of the sort that are condemned by formal rules for composition. The excellencies are of a broader kind. Chief among these is the easy movement of the story, which holds the reader's interest in spite of the scientific and philosophical discussions that are so frequently interspersed. The ordinary novelist, when he attempts a narrative that is improbable, aims to secure credence by various literary tricks. These may be successful for a time, but if the reader once begins to consider them, their true nature is as readily seen as is that of the stage settings for a melodrama. Prof. Lloyd's introduction, indeed, shows careful literary ingenuity. This is apparent in the way in which he suggests freemasonry, and the famous Morgan case, while he avoids anything that could definitely prove that he had these in mind. After the story is fairly under way, however, his simple, straight-forward narrative method forms a pleasing contrast to the labored plans of some more famous writers.

In regard to the ideas for the sake of which the work was evidently written, little may be said without disregarding the request of the author, quoted above. Some phenomena that are mentioned are perhaps not so novel as the writer would have us suppose; e. g. the abstraction of water from a solution (p. 140), which has doubtless been noticed by every student who has dipped a piece of filter paper into a solution of a colored salt. But the application, in this case as in others, is doubtless original. The detailed cosmography is of course to be taken as imaginary, and serves mainly to illustrate the speculations as to force.

To any one but a specialist in science, the most interesting suggestions are those of a metaphysical nature. The idea of "eternity without time" (Chap. XLII) is a startling conception, and will fascinate even a mind that at once rejects it.

But although a critic is tempted to discuss the theories set forth in the volume, such a course would be both unprofitable and unfair. As has already been said, the work is suggestive, not didactic. The author will doubtless feel that he has accomplished his purpose if he incites his readers to think more deeply on the questions which science raises, but which lie outside her narrowest materialistic confines. The scope of the work is broad enough to furnish a stimulus to any earnest scientist, no matter what his field. The nature and direction of the thoughts that it arouses will be determined by individual tendencies.

The reader may be somewhat puzzled when he observes that the heroine, if so materialistic a term may be used, is known by the reversed name of a goddess whose most familiar characteristics are sensual. The clue to the proper interpretation is probably found in the crescent moon shown in the illustration, p. 254. This is an attribute, not of the Greek Aphrodite, but of her eastern original, who ruled over the creative forces of nature. Etidorhpa, however, has no single prototype. Of herself she says (p. 257): "I have been known under many titles, and have comforted many peoples. Strike my name from Time's record, and the lovely daughters of Zeus and Dione would disappear; and with them would vanish the grace and beauty of woman; the sweet conception of the Froth Child of the Cyprus Sea would be lost; Venus, the Goddess of Love, would have no place in song, and Love herself, the holiest conception of the poet, man's superlative conception of Heaven's most precious charms, would be buried with the myrtle and the rose."

Although the story is sufficiently fascinating in itself, the pleasure of the reader is increased by the fine typography, presswork and binding of the volume. The illustrations by J. Augustus Knapp also add much. Of these, the photogravure of Etidorhpa is exquisite. The cuts in black and white are very uneven in quality, but many of them are most excellent.

To most of those who have been so fortunate as to secure a copy of Etidorhpa it will probably prove an inspiration. The author has perhaps done well, however, not to give the volume a general circulation. It is conceiveable that to persons who are accustomed to give full credence to Jules Verne, his excellencies might prove a pitfall. Vividness and plausibility of statement is sometimes mistaken for proof; and Prof. Lloyd might find himself at the head of a school of followers of whom he could hardly be proud.

William B. Cairns.

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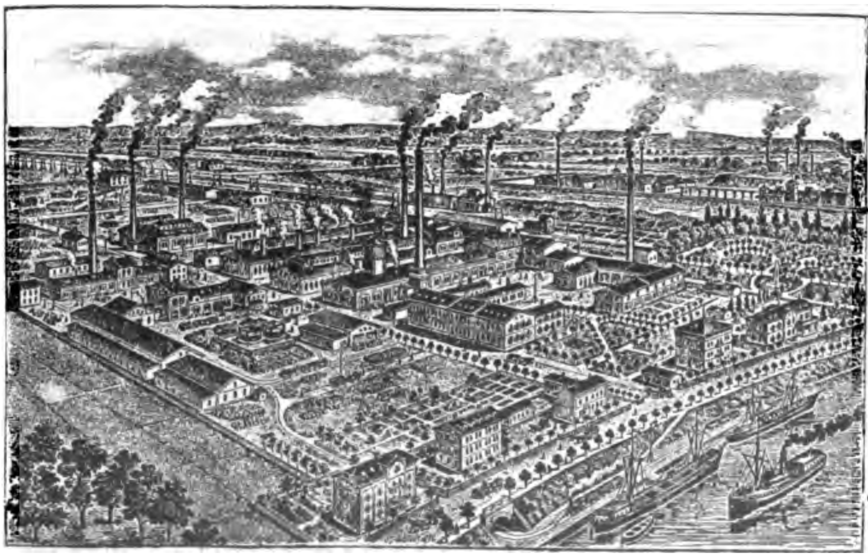

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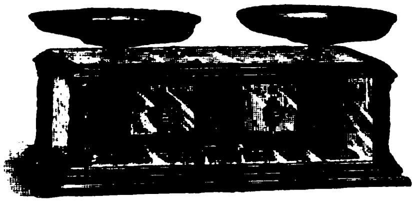

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 2. **FEBRUARY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
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ANNOUNCEMENT FOR 1896.

Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An Illustrated Monthly Journal.

Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY

DR. FREDERICK HOFFMANN AND **DR. EDWARD KREMERS.**

WITH THE CO-OPERATION OF

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Vol. 14, No. 1. **JANUARY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

WITH the beginning of this year and of the 14th volume, the journal heretofore known as the **Pharmaceutische Rundschau** assumes the title of the **Pharmaceutical Review.** In consideration of some other changes incidental thereto we deem it expedient to offer the following remarks.

Under the able editorship and management of Dr. FREDERICK HOFFMANN, the **Pharmaceutical Review** during the past thirteen years of its existence has acquired an enviable and leading position among the pharmaceutical journals of this country and of Europe. Whereas most American pharmaceutical journals have become the organs of commercial houses, the instruments of advertising agencies, or exponents of special colleges of pharmacy, the **Pharmaceutical Review** in the consideration of all matters of professional, educational, and trade interest has always maintained an uncompromising independence. This prerogative, together with masterly literary attainments, and the sound knowledge and judgment which can only be acquired by long experience in professional life, have combined to give the editorials and all other contributions from the pen of Dr. HOFFMANN particular value and force. It is thus that this journal has also attained the reputation, both at home and abroad, of being fearless in the expression of its opinions, and true to the principles upon which it was established.

The fact that the greater part of the **Review** has been printed in the German language has given rise to numerous and constantly increasing requests to extend the usefulness and influence of the same by printing it in the English language. This request is to be granted with the beginning of this year, but not to the extent of the total exclusion of the German. Such articles from German contributors as would suffer by translation will hereafter, as in the past, be published in German, or in both English and German; but the main part of the journal will be printed in the English language. This change in the character of the **Review** we believe will prove in every respect advantageous, for most, if not all, its German readers in this country are as conversant with the English as with their own language, and the same is almost equally true of its many subscribers and readers in continental Europe.

The greatest change which the **Pharmaceutical Review** is about to experience consists in the partial retirement of its distinguished founder and editor, Dr. HOFFMANN. The fact, however, that his name still appears foremost on the title page, clearly shows that his interest in the journal by no means ceases with his retirement from the more active duties of its management. The names of the co-laborers not only demonstrate that the **Review** has gained a wide circle of friends, but will also serve to remove any suspicion that a partial change of editorship may be attended by any loss of independence or general breadth of character. The national character and the high standard which the **Review** has acquired under the able management of Dr. HOFFMANN, are to be maintained at all hazards; sectionalism and partisanship are to be equally avoided.

Pharmaceutical Review Publishing Company, Milwaukee, Wis.

Original contributions, books for review, exchange journals and all other editorial matters should be addressed to DR. EDWARD KREMERS, MADISON, WIS.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 2. FEBRUARY, 1896.

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

The Value of Practical Experience.

THE fact that the University of Wisconsin followed the precedent established by Ann Arbor, and in 1894 dropped the practical experience clause from the requirements for graduation, and that since then a number of university schools and independent colleges of pharmacy have done likewise, has given rise to considerable excited discussion and even to demonstrations of ill-feeling on the part of some. This ought not to surprise any one who knows how deep-rooted are the prejudices of the past. It is really surprising that so many have come forward during the last year advocating the abandonment of one of the traditional requirements of American colleges of pharmacy. Whereas the advocates of the new movement have every reason to rejoice over this unexpected success, they can only be discouraged by the misrepresentations on the part of some of those who still cling to the old doctrine.

The advocates of the new movement are again and again accused of depreciating the value of practical experience, whereas, they are really among the staunchest defenders of practical experience. Not one of those who are attacking their so-called non-experience colleagues, or who are advocating the old system on the "educational" basis of dollars and cents has quoted a single sentence in which a follower of the new movement has claimed that graduates without practical experience should be permitted to practice pharmacy. The question is not at all one of experience or no experience, but of the time and position such experience shall occupy in the educational system of the pharmacist. Incidental thereto is the question, shall the college of pharmacy or the state board of pharmacy have jurisdiction over the time spent by apprentices and assistants in drug stores?

Practical experience before or after the college course.

In an article on Apprenticeship, [Pharmaceutische Rundschau, October, 1894.]* the writer traced the historical development of this institution. The historical study of this theme clearly showed that it had its origin in a very primitive stage of civilized society; that with the healthy development of the guilds it grew normally and was at its prime in the 15th century; that with the decay of the guilds it was weakened and that during the past century profession after profession dropped the same. The study of the modern development of the professions clearly demonstrated that the farther a profession had advanced the less was left of this primitive educational system. Instruction by specialists under the more favorable conditions prevailing at colleges and universities, is more and more replacing the instruction by the preceptor or master under conditions that are not favorable to, but often positively detrimental to thorough study.

This, however, by no means implies that the college graduate is a finished product. Those colleges who graduate young men and women without practical experience claim nothing of the kind. They have but an educational function and try to offer to the masters of the profession such young men and women as have a capacity to become masters in turn if they receive the proper guidance at the hands of their experienced elders. These schools ask of the profession not to take the illiterate apprentice but to try young men and women with a fair secondary and college education. Certainly no one will deny that the college graduate will be more benefited by two years of practical experience under proper guidance than the apprentice of twelve, fourteen or at most sixteen. The one comes prepared not only with a well-trained mind, but with a general knowledge of the pharmaceutical sciences, of which the other has not even dreamt. The former acts understandingly, whereas the latter can learn to act merely according to the rule of thumb. A college course never can and never will take the place of every day experience of the drug store. A college degree, as will be shown later, should not imply practical qualification. Unfortunately, in this country, owing to the primitive educational conditions of the first half of this century, it has been made to imply such qualification. Yet no sick person will call on a newly fledged M. D. in a serious case unless compelled by circumstances. No business man will entrust an important legal transaction to a bachelor of law fresh from college; no railroad corporation the construction of a bridge to a recent bachelor of engineering. Congregations, however, are willing to have their souls fed by ardent theologians just from the seminary and druggists expect that a pharmaceutical graduate should know all of the ins and outs of a drug store. Congregations make allowance for freshness of their candidates, but druggists are merciless in their condemnation of graduates who don't know how "to wrap a package," "to sell a piece of soap" or "to make an attractive window display." Yet these are the very criticisms made by those who find fault with the college graduates. If pharmacy is to develop into a learned profession the apprentice must be doomed and the college graduate must take his place while serving his time of probation. A valuable superstructure can be built only on a thorough foundation. Such a system would also put an end to the excessive competition which has so commercialized our calling that but a small professional remnant remains. The high educational standard which will be the best protection of the public, — the *raison d'être* for all pharmaceutical legislation — will also protect the pharmacist and make his business remunerative by preventing Tom, Dick and Harry from entering into reckless competion with him.

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* Copies of this article can be had upon application to the writer.

Shall the colleges of pharmacy or the state boards have jurisdiction over the personell of the drug stores?

At the time that the customary requirements for graduation from colleges of pharmacy were established there was no pharmaceutical legislation by the state, consequently no state board that had jurisdiction over the personell of the drug stores. In this fact lies the reason for the practical experience clause as one of the requirements for graduation by the older colleges. Here also lies the reason for the present misunderstanding.

The first college of pharmacy established in Philadelphia in 1823 was a creation of the druggists of that city, who recognized the need of a systematic training for their apprentices which they themselves could not give. The evening course offered was of the type of the *Fortbildungsanstalten* offered to apprentices of the various trades in Europe. The preceptors themselves constituted the membership of the college and elected largely from their own number competent lecturers for the few important branches to be taught, viz. chemistry, pharmacy, botany and materia medica. It was a course of professional self-education and redounded to the credit of these men. On the other hand, the larger colleges and universities of the East, while offering courses in medicine, law and even theology, looked down upon the somewhat crude attempt of those who were interested in the safety and well-being of mankind and the elevation of their calling — a calling which they loved, though it has never received much support or appreciation from the public at large and little but denunciation from its related profession, medicine. The eastern colleges and universities in making possible the establishment of these schools, committed a sin of omission for which the public has had to suffer ever since. It was a state university of the Northwest which first recognized its responsibility toward the public in this direction.

These older colleges, organizations of the druggists' fraternity, and controlled by them, were not only seats of learning, but were legal and judicial councils as well. Their object was not to educate young men and women in order to enable them to enter upon a calling with a well trained mind, but to take such material as they already found in the drug stores as apprentices and to improve as far as possible their meagre opportunities for learning. The idea was not to improve the system, but to some extent the efficacy of that system, viz. that of apprenticeship. In this they have no doubt succeeded to no small extent. They have done even more: they have materially assisted in demonstrating the inefficiency of the system.

Attention has already been called to the fact that these organizations of practicing druggists, termed colleges, acted also in the capacity of judicial councils. Being self-constituted they were wanting in authority even in their own ranks. This was soon felt and in the older states these colleges soon became the strongest supporters of state legislation. The state laws which resulted, soon assisted in impressing on the colleges the true stamp of merely educational institutions. For a time the diplomas of the colleges were accepted as prima facia evidence of practical qualification. This led to the establishment of numerous colleges which were largely frequented by young men as the best and easiest way to avoid the state board examination. The result can be anticipated. The multiplication of colleges did not improve pharmaceutical education and state boards began to discriminate and ultimately to refuse all diplomas. In this respect the evil course of competition brought about a good result. The colleges became more and more educational institutions and the state board took control of judicial matters.

In many of the northwestern and western states pharmacy laws and state boards were established before the schools of pharmacy. Yet even here the proper function of the school was not always recognized immediately. Those who had secured pharmaceutical legislation and the establishment of chairs of pharmacy in connection with state universities or private institutions were saturated with the traditions of eastern states. It was in connection with these state universities of which the established courses of pharmacy were an integral part, that the inconsistency of their dual position was first recognized. Universities as well as colleges are educational institutions and that only. They may become advisory bodies but never should assume functions of state boards. The functions of advocate and judge might as well be incorporated in one person. It was a wise act on the part of legislatures to provide for an education in pharmacy as well as in agriculture or engineering, in philosophy or Greek. However, these same legislative bodies enacted laws which placed the authority to control the conditions of pharmacy of the state in the hands of a state board. State board and state university or college should work hand in hand for the physical welfare of the community and the improvement of that branch of the healing art which they represent; but the duties of the one should never be confounded with the authority and duty of the other. When the exact relations of the two are more perfectly understood we may no doubt expect better results.

The law enacted by the last legislature of Wisconsin placed a clear and definite interpretation upon the relation of the state university and the state board. Recognizing the value of a university course, it gives the university graduate the advantage of the time and money spent in preparing himself for a calling that is of sufficient importance to demand state control. The university is to teach him the pharmaceutical sciences, but it is not to decide whether its own graduate is fit to practice pharmacy or not. The university graduate must have had two years of experience with practicing pharmacists before he can present himself to the state board for examination. In other words, having received his scientific training, the university graduate must serve two years of probation with those who are supposed to be qualified, and then the state board of examiners will determine whether he is fit or not to practice pharmacy independently.

This relation foreshadows a more ideal condition to be hoped for in the future. The universities are far from underrating the experience well trained young men and women can receive in well equipped pharmacies. The state board, not the university, however, has by law control over the time spent in such pharmacies. There is but one logical consequence. The state board, not the university or college, must determine whether such time has been well spent, and whether the young man or woman with the scientific training of university or college has sufficiently profited by such time of probation to be trusted to practice pharmacy independently thereafter. *E. K.*

◆

Announcement.

If one may judge from the expressions of opinion received, the change from the German to the English language has met with general approval, not only on the part of those who could not read the Rundschau before, but also on the part of the German contingent of its readers in this country. Numerous expressions of good will have been received from its old friends among the readers, also from editors of the better class of American pharmaceutical journals. The Pharmaceutical Review is highly appreciative of and grateful for such expressions of collegiate good will. Nothing will be left untried to make the Review deserving of all praise that has been bestowed upon it.

The opinion expressed by some that the Pharmaceutical Review was to be a new journal, no doubt has been dispelled by the January number. Although, with the completion of the thirteenth volume, Dr. Hoffmann has retired from the formal management of the journal established by him, he will still maintain an active interest and participation in its affairs.

With the opening of the new year Dr. Hoffmann sailed for Europe to enjoy a much needed rest. On the evening of December 27th a few personal friends met in the rooms of the German Club of New York to bid him farewell. The farewell, however, was coupled with the hope and the expressed belief of all present that before long we should have the pleasure of again seeing him on this side of the Atlantic. While abroad, Dr. Hoffmann will contribute to the Review the results of his observations on several events of great pharmaceutical interest. At the Industrial Exposition at Berlin, chemistry and pharmacy will certainly be well represented. The International Pharmaceutical Exposition at Prague, to which Dr. Hoffmann has been appointed juror, will also afford an abundance of material for correspondence. Several European pharmaceutical societies will celebrate their 25th and 50th anniversaries respectively. American pharmacists may therefore congratulate themselves that a careful observer and an excellent writer will be on the field to inform the readers of the Pharmaceutical Review.

E. K.

ORIGINAL CONTRIBUTIONS.

Kava-Kava.

By *Dr. Rodney H. True.*

It seems to be a well established fact that mankind has an inborn craving for something of an intoxicating nature, and, as if to furnish the means for the satisfaction of this craving, Nature has supplied almost all parts of the inhabited world with some plant or plants which either directly or after proper preparation supply the sought-for article. Among the plants possessing intoxicating principles is one which of late has attracted considerable attention among physicians and pharmacists, namely, *Piper methysticum*, commonly known as kava-kava.

This is a near relative of the plant producing the commercial black pepper, *Piper nigrum*, also of that yielding cubebs, *Piper cubeba*, and like them is from the warmer climates of the East. *Piper methysticum* is a shrub usually about six feet in height, with a growth resembling somewhat that of the bamboo. The stems, having a diameter of one to one and one-half inches, are jointed, the nodes being separated by a distance of three or four inches. The thin leaves are heart-shaped, three to four inches in length, and of nearly equal width. The root system is large and spreading, weighing when fresh from two to four pounds, usually, but occasionally as much as twenty. In drying, it loses about one-half its weight, having in this dry condition, a light, fibrous structure. The root is covered externally by a thin, grayish-brown bark and, when fresh, the interior is of a yellowish color. It is this large root system and the bases of the stems that furnish the kava-kava used by the natives and by physicians.

This plant seems to have a wide geographical distribution, appearing to grow on almost all of the tropical and sub-tropical islands of the Pacific ocean. It seems too to be known under a variety of names. In Tahiti, it is known as the "ava-ava"; in the Sandwich Islands as "kawa-kawa"; in the Marguesas Islands as "kava-kava", while the Fijians call it "yakona." The various names, however, are not confined strictly to the islands named.

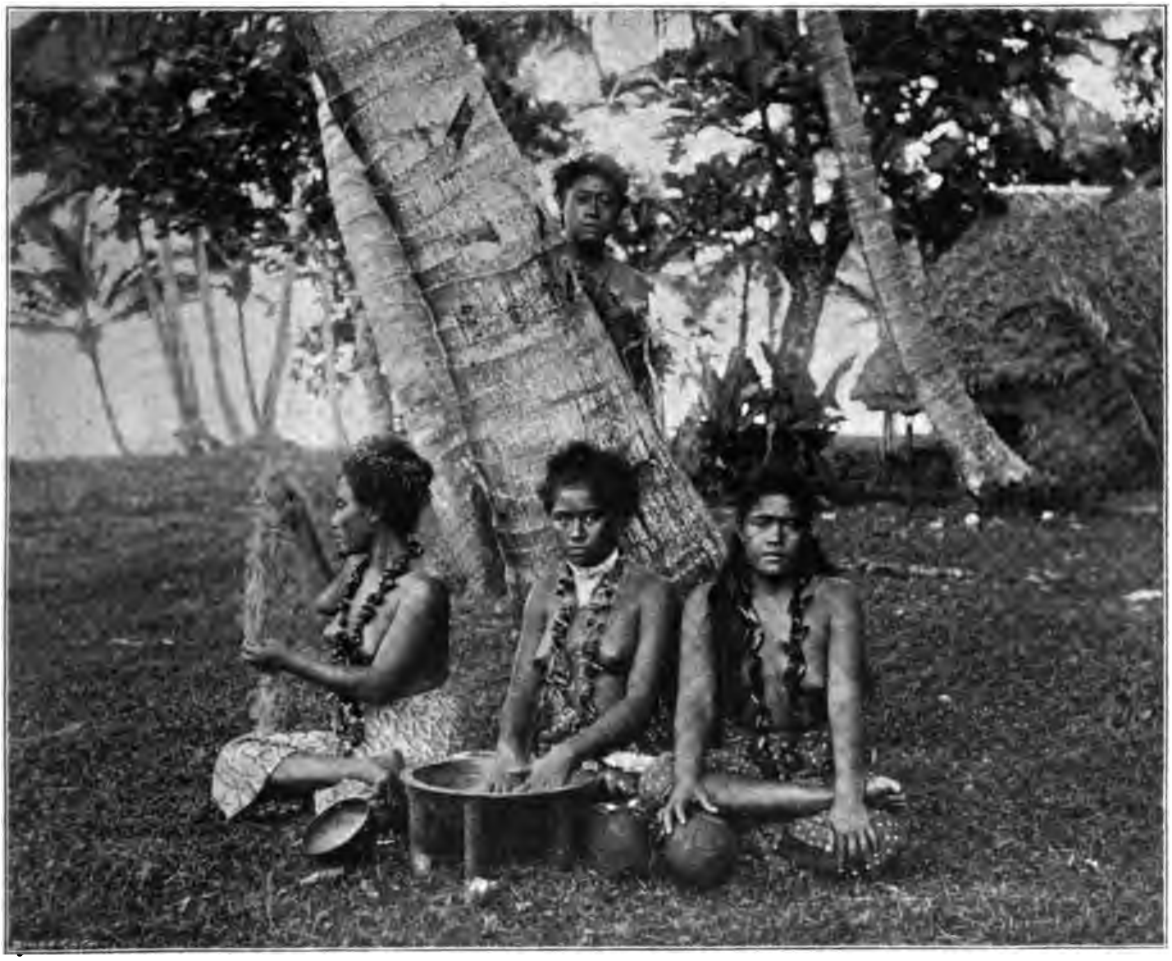
This plant in common with the other members of the pepper family has a very characteristic structure. The transverse section of the root shows a thin bark underlaid by a very thin cortical region. The central pith, occasionally somewhat eccentrically placed, is in the larger roots quite ample and in the dry drug is usually cracked leaving a central cavity of greater or less size. In the smaller roots, the pith is frequently very much reduced and hardly at all represented. The woody bundles appear as lines extending from the circumference of the pith, in the older roots, to the bark. The lighter colored alternating areas, usually a number of times as wide as the woody portions, are the medullary rays. Occasionally a woody bundle is seen to fork. The pith is soft and mealy as are also the tissues forming the medullary rays, the cells of both being closely packed with starch grains. In these two regions as well as in the thin cortical layer just beneath the bark, are cells containing the resinous active principles of the plant, the woody, fibrous part being practically wanting in resin-containing reservoirs. In large roots a sort of network is formed by woody masses that extend from one wood region to another, perhaps to hold the widely separated woody regions together and to prevent them from splitting apart along the ample medullary rays.

Although coming to our notice as a drug at a comparatively recent date, kava-kava has been long known. The first published account of the plant and more especially of the uses to which it is put by the natives of the Polynesian Islands, seems to have been given by Captain James Cook, the famous English explorer. He found the plant first, it seems from the journal of his first voyage around the world, in the Tahiti Islands in 1769. Since the manner of use is more fully described by a later writer, we will neglect Captain Cook's account beyond the mere observation that he believed the plant to be widely distributed among the islands of the Pacific ocean. In the account of his Three Famous Voyages Round the World the reader may find frequent mention of the plant in question.

M. Lesson published about 1822, a notice on this plant in which he says "the natives of Carolina" (probably the Caroline Islands) "prepare a drink from it which they call sheaka".

In 1844, T. R. N. Morson published an article in the Am. Journal of Pharmacy, p. 105, in which he described the process by which the natives of the Tonga Islands prepare an intoxicating drink known by the name of kava-kava. The preparation is attended by a rather elaborate ceremony which is described in Mariner's History of the Tonga Islands. Since this ceremony is of considerable interest, a description condensed from Mariner's account is here given place. Although it is indulged in privately, the brewing of the drink seems to be a characteristic feature of public occasions, when it is prepared before a considerable company.

The root, after being scraped clean with mussel shells, is chopped up into small pieces which are passed around to those in attendance to be chewed. Among the company, which up to this time has been silent, is now set up a social hum and the chewing of the root begins. No one volunteers for this work, however, but young persons who have good teeth, clean mouths, and who are not suffering from colds. Women frequently take their share in this work. After a few minutes of diligent mastication, the root is sufficiently ground up and the moist pulp in the form of a ball is laid on a piece of banana or plantain leaf. After enough root has been chewed, silence again ensues. A wooden bowl sometimes three feet in diameter and a foot deep in the center is placed on the ground before him who is to make the infusion. The chewed masses are now brought to him and carefully placed in the bowl, first on the bottom and then up the sides, thus exhibiting the quantity of root available for the infusion and enabling a judgment to be made concerning the quantity of the beverage. All now seat themselves and the man who has charge of the bowl presents it to



Preparation of Kava-Kava. *

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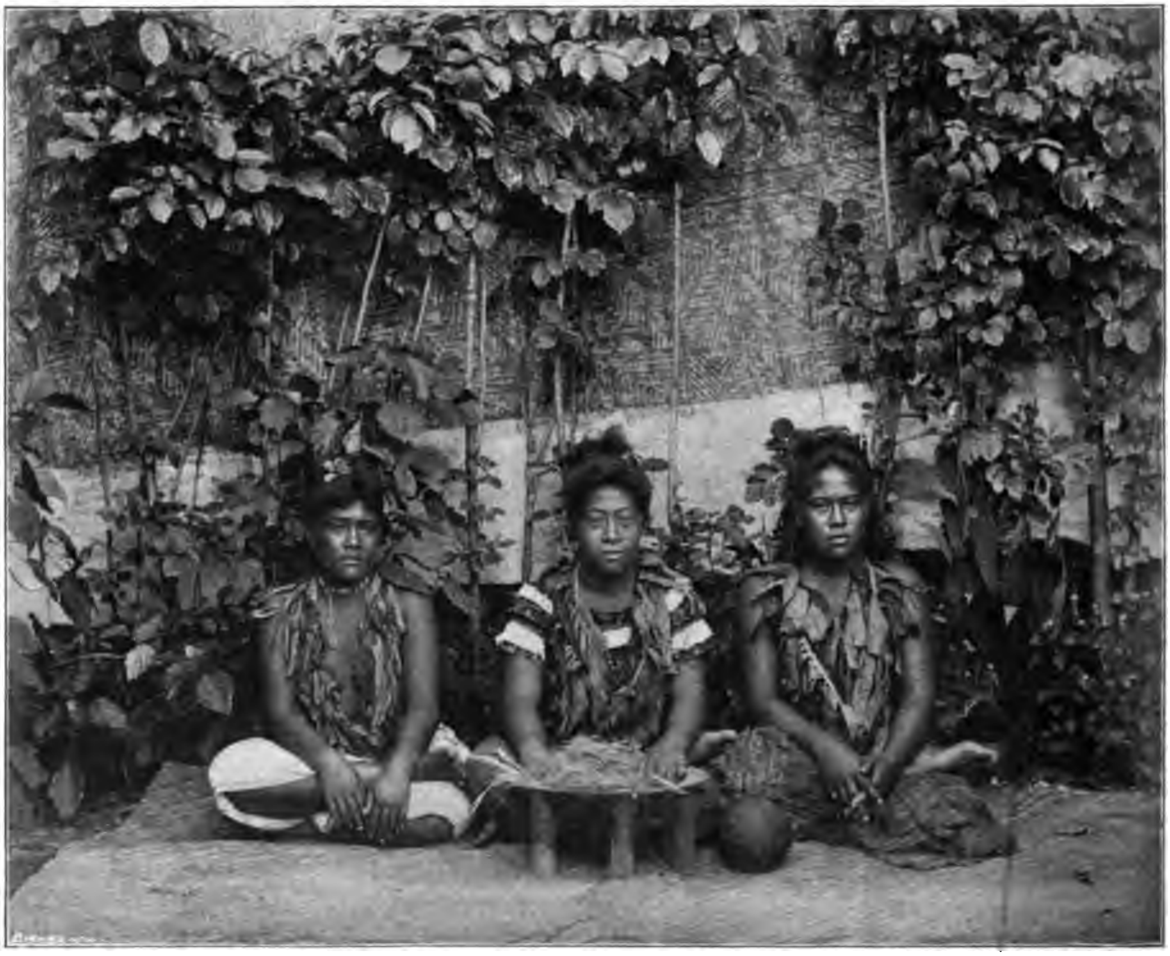
* Utensils used in preparation of Kava-Kava. Bowl in middle, cocoanut shell near by; "fow" held up by person at left side of picture.

the chief. If the latter thinks more is needed, more root is brought and the chewing process is resumed until the required amount of the pulp is obtained. The two assistants who are to obey the master of the brew now take their places on opposite sides of the bowl, one to fan away the flies with a large leaf, the other to pour water from cocoanut shells over the pulp. Before this is done, the man in charge washes his hands and kneads the balls of chewed root into an homogeneous mass. Water in sufficient quantity is now poured over it, mixed with the mass and the dregs pressed firmly together at the bottom of the bowl. The "fow" is now produced, a mass of fibrous material obtained by tearing the bark of a native tree into narrow strips. To hold the strips together, they are at one end braided into a narrow margin. This strainer, for such is the office of this article, is now thrown on to the surface of the liquid, the edges on opposite sides of the bowl are carried down along the sides of the bowl to the bottom where they meet, thus enclosing the mass of pulp. The "fow" and the entangled dregs are now raised from the dish and the infusion carefully wrung out. This process is two or three times repeated until only very fine particles remain. The beverage has now the color of coffee with plenty of milk added, and it is ready for use. Cups artistically constructed from pieces of banana leaves are now made and filled. The filling is done by wringing the saturated mass of fibre over the cup. The name of the person to whom the draught goes is now announced. He replies by clapping his hands to show where he sits and the cup-bearer brings it to him. If he be a chief, the cup is presented by the attendant sitting, if not, while standing.



Preparation of Kava-Kava. *

If drunk in moderate quantity consciousness and reason are in no way impaired, becoming on the contrary even sharpened. After more has been taken a condition of happy carelessness follows, the individual shows a dreamy consciousness, and if still more be imbibed, the limbs become languid, gradually the will loses power over the muscles, co-ordinated movements cannot be easily executed, the individual lies down and sinks gradually into a sleep. This state, according to Lewin, may last for from two to six hours, the awakening being accompanied only by a languid feeling in the limbs. In a recent account of the Fijians in the Pop. Science Monthly, Dec. 1895, Weld says that a partial paralysis of the lower limbs may occur before consciousness is at all affected. Certain it is that the intoxication caused by kava-kava is of a mild, quiet type which does not render the individual ugly and quarrelsome, a point of superiority claimed by the natives for their drink over the alcoholic beverages of the Europeans.

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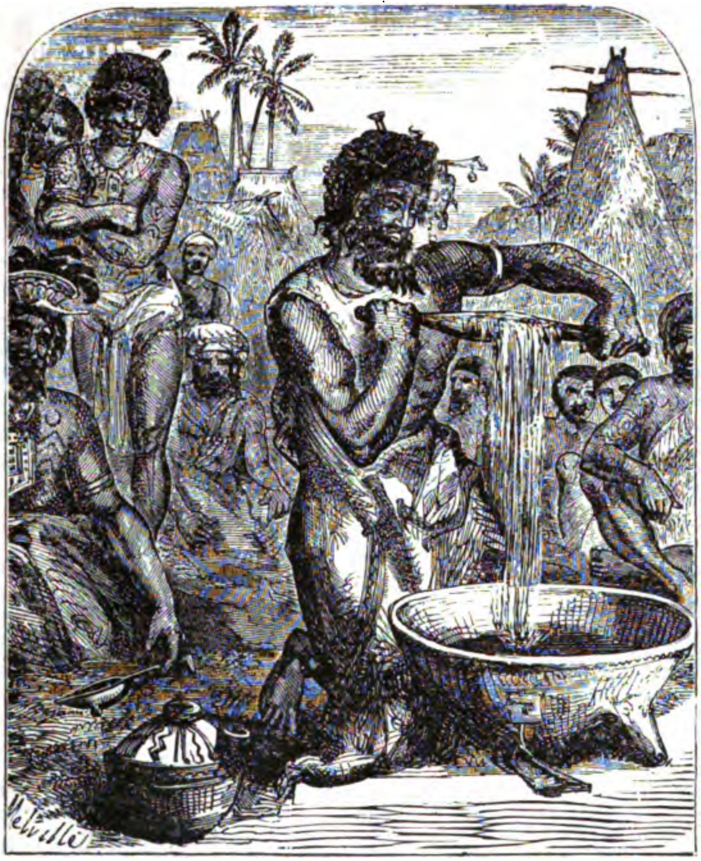
* "Fow" shown in use, thrown on surface of infusion in bowl.

These pictures are from photographs taken in the Samoan Islands, and now in the pharmacognostical collection of the School of Pharmacy of the University of Wisconsin.

Used in moderation, kava-kava is probably not followed by injurious effects, according to Seemann's Mission to Viti, but when taken in excess it gives rise to skin diseases, owing to its over-excitement of the sweat glands. Dr. Gulick says that the natives of the Sandwich Islands use it as a cure for cutaneous diseases, the effect of a continued treatment with kava-kava being the cracking and falling off of the cuticle over the whole body. In parting with this, the system is believed to be freed from its maladies. Kava-kava is also effective in preventing corpulency, a condition very unpopular in these islands. In addition to the strong sudorific action, it is held that this beverage is responsible for a diseased condition of the eyes seen in habitués of the kava.



Preparation of Kava-Kava. *

The physiological action of the drug is consistent with the effects of the beverage on the drinkers as mentioned above. The results of the investigation of several experimentors is summed up by Dr. Cerna in the Therapeutic Gazette, 1891, p. 7, substantially as follows: Taken internally or through hypodermic injections, the drug produces an increased flow of saliva, a burning sensation in the mouth, followed by a marked numbness, a general depression of nearly all the normal functions, and lastly paralysis, this being most noticeable in the hind extremities, especially in the case of the frog. Simply placed on the tongue, the drug produces a momentary burning sensation with increased secretion of saliva, which is soon followed by a local numbness, lasting for a considerable time. When the fluid extract is applied directly to the cornea and conjunctiva, sensibility is lost in a very short time and the eye can be irritated and even scratched without signs of pain being shown by the animal. The great muscular weakness observed in higher animals, under the action of the drug, is of spinal origin since the higher nerve centers retain their normal functional activity. This is seen in the native who with a clear head finds himself unable to "walk straight" after too freely imbibing of kava-kava. Small as well as larger doses depress the circulatory system and finally in sufficiently poisonous amount, kava-kava produces death through failure of the respiration or through cardiac paralysis, especially the former.

Although complete unanimity on the subject does not prevail among investigators, it seems probable from Dr. Lewin's researches, that the active principle producing the anæsthetic effect is the resinous substance present. Since resin itself is not soluble in water, an apparent contradiction arises. If insoluble in water, how can the beverage of the natives, simply a cold infusion of the ground root, produce its characteristic action? During the progress of an investigation of the kava-kava in the chemical laboratory of the School of Pharmacy of the University of Wisconsin, the presence of potassium chloride in the alcoholic

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* Infusion being wrung from "fow".

From cut in Captain Cooks Three Famous Voyages around the World. London. Ward, Lock & Co.

extract containing the resin was detected. Investigation has rendered it probable that this salt stands in a peculiar relation to the resin molecule, being apparently in chemical combination with it. It seems likely that this peculiar condition may explain the somewhat paradoxical situation before us. The formation of an emulsion with water seems to be indicated. This question is receiving further investigation.

Pharmacognostical Lab.,
University of Wisconsin.

Oil from Pycnanthemum Lanceolatum Pursh.

By *W. G. Correll.*

In the early part of the month of August, 1894, mountain mint in full bloom was collected in low meadows south of Madison, Wis. The plant was identified by Mr. L. S. Cheney, instructor in pharmaceutical botany in the university. The flowering herb was air-dried and the dried product distilled as soon as convenient with water vapor. The oil obtained was of a yellow color of medium depth; its odor resembling that of pennyroyal. The specific gravity at 20° was found to be 0.9135, and 0.9170 at 15°. In a 100 mm. tube the oil at 20° turned the plane of polarized light 2.95° to the right, hence $[\alpha]_D = + 3.25°$.

In 1877 Dr. Charles Mohr made an examination of *Pycnanthemum linifolium* Pursh., a household remedy used extensively by southern negroes, but states very little of the volatile oil. (Proceedings of the A. Ph. A., Vol. 34, p. 513.) Dr. Mohr calls attention to the close botanical relationship of *Pycnanthemum linifolium* and *Pycnanthemum lanceolatum*, both of which were described as one species by our earlier botanists, as *Thymus virginicus* L.

Somewhat more than a year ago H. C. Barker made an examination of *Pycnanthemum lanceolatum* (Am. Journ. Pharm., Vol. 66, p. 65). The specific gravity of his oil was 0.9361 at 15° C. The U. S. Pharmacopoeia gives the specific gravity of oil of pennyroyal as 0.93 to 0.94 at 15°. The similarity of the odor of oil of *Pycnanthemum* with that of pennyroyal, the almost like specific gravity of the two, the similar behavior on heating, would strongly indicate a resemblance of the two oils. In order to ascertain the correctness of the suspicion a small quantity of the oil was distilled last summer and has recently been tested for pulegone, as well as phenols.

Isolation and Identification of Carvacrol.

In his report on *Pycnanthemum linifolium* (loc. cit.) Dr. Mohr called attention to the fact that both the *P. linifolium* and *P. lanceolatum* have been described by earlier botanists as *Thymus virginicus* L. This led the writer to make a preliminary test for the phenols, thymol and carvacrol. The test with ferric chloride failed, but that with caustic potash and chloroform gave the characteristic reaction of thymol and its isomer carvacrol.

Carvacrol was isolated from the oil of mountain mint by shaking the oil with an equal volume of a 10% aqueous solution of caustic soda. From the caustic soda solution, after separation from the oil, the carvacrol was precipitated by adding dilute hydrochloric acid in excess. The eliberated carvacrol was purified by distillation with water vapor. About 6.2 grams or 7.2% of bright yellow carvacrol were thus obtained.

Carvacrol sulphonic acid was prepared by adding 5 ccm. of concentrated sulphuric acid to 3 grams of carvacrol and stirring until the mixture began to solidify when it was set aside over night. A small quantity of water was added, which formed a reddish liquid with the crystalline magma. Upon standing, crystals again formed which were separated. After drying, the lighter colored crystals were picked out. They melted at 56°—57°. Carvacrol sulphonic acid is stated to melt at 58°, thymol sulphonic acid at 98°.

Dicarvacrol was prepared by adding solution of ferric chloride to the aqueous distillate from which the carvacrol had been separated. The dicarvacrol crystallized on standing, and when dried melted at 145°—147°. Dicarvacrol is stated to melt at 148°, dithymol at 165°.

According to A. v. Baeyer (Berichte, Bd. 28, p. 653), a very dilute alkaline solution of thymol, also one of commercial carvacrol were prepared. To each were added a small quantity of sodium nitrite solution, then dilute hydrochloric acid, and the solution let stand. Over night, yellowish-brown needles separated which were dissolved in aqueous ammonia and precipitated with dilute acetic acid. The thymol derivative produced a solid amorphous precipitate, the carvacrol derivative oily drops which crystallized shortly.

The carvacrol from the oil of mountain mint, when treated according to this process, gave the same reactions as the commercial carvacrol.

Tests for Pulegone.

The oil after the removal of the phenols was tested for pulegone. (1) According to Beckmann by attempting to prepare pulegoneoxime. (2) According to v. Baeyer (Berichte, Bd. 28, p. 653), by trying to obtain nitrosopulegone.

Both tests, although tried repeatedly, gave negative results inasmuch as no crystals could be obtained. Duplicate experiments were made successfully with oil of pennyroyal.

Fractionation of the Oil.

Four fractions of the oil were obtained, each containing about the same amount, leaving in the fractionating flask a small quantity of residue of a reddish-brown color and of a syrupy consistency. The fractions were placed in a freezing mixture twenty-four hours, but nothing separated.

First fraction	180°—200°
Second "	200°—210°
Third "	210°—220°
Fourth "	220°—230°.

The last fraction on standing developed a slight peppermint-like odor, and was of a light yellow color. At 20° it had a specific gravity of 0.9224. In a 100 mm. tube the fraction turned the plane of polarized light 13.73° to the right, hence $[\alpha]_D = +14.88$. The great difference between the rotatory power of the fourth fraction and that of the original oil clearly indicates the presence of other optically inactive substances in the lower boiling fractions. Upon combustion the fourth fraction yielded the following results:

I. 0.231 g. yielded 0.6668 g. CO_2 = 0.18185 g. C,
and 0.231 g. H_2O = 0.02575 g. H.
II. 0.1858 g. yielded 0.534 g. CO_2 = 0.14547 g. C,
and 0.1854 g. H_2O = 0.0209 g. H.

Calculated for	Found	
$C_{10}H_{16}O$	I.	II.
C . 78.94 p. c.	78.72 p. c.	78.83 p. c.
H . 10.52 p. c.	11.14 p. c.	11.24 p. c.

This corresponds with the formula of pulegone, but the fraction failed to give the nitrosopulegone reaction. Unfortunately one half of the small quantity of oil was accidentally lost, so that further attempts to identify this fraction had to be given up for the present.

In the early part of the month of June, 1895, a second quantity of mountain mint was collected before it had blossomed, and distilled with water vapor. A small quantity of the oil was obtained which at 20° had a specific gravity of 0.9160, the specific gravity of the first oil being 0.9135 at 20°. In a 100 mm. tube the oil turned the plane of polarized light 0.810° to the right, hence $[\alpha]_D = +0.88°$; the $[\alpha]_D$ of the first oil being $= +3.25°$.

On fractionation under diminished pressure three fractions of the oil were obtained.

First fraction	90°—110°	under 34 mm. pressure.
Second "	110°—135°	" 33 " "
Third "	135°—138°	" 36 " "

Each fraction, heated with caustic potash and chloroform, gave the characteristic reaction for carvacrol. When the fractions were treated with an equal volume of a 10% aqueous solution of caustic soda it was found that they contained about 9% of carvacrol. The quantity of oil was too small to allow of further examination. During the past summer some more oil was obtained. This will be examined as soon as an opportunity presents itself.

A Convenient Test for Thymol and Carvacrol in Volatile Oils.

The presence of carvacrol in oil of *Pycnanthemum lanceolatum* was indicated by the beautiful purple-red color produced on heating 0.01 gram of the oil with 0.01 gram of caustic potash and 20 drops of chloroform (Flückiger, Pharmacognosie, 3rd Ed., p. 156). A small quantity of commercial thymol and carvacrol were each treated in the same way. The carvacrol gave a beautiful purple-red, the thymol a similar color. In order to test the general application of this reaction, oil of monarda and oil of thyme, which are known to contain these phenols, were tested in this manner and gave the characteristic reaction.

The following labiate and coniferous oils, which are not supposed to contain these phenols, when tested, did not give the reaction for thymol or carvacrol: Three samples of pennyroyal oil, two of spearmint oil, one each of the oils of spike, lavender, rosemary, balm, and peppermint; also two of turpentine oil, one each of the oils of juniper berries, savin, cedar, balsam fir and white spruce.

Pharm.-Chem. Laboratory,
University of Wisconsin.

New Chemical Balances.

By *Dr. Louis Kahlenberg.*

Some months ago two new chemical balances were sent to the Department of Pharmacy of the University of Wisconsin by Paul Bunge of Hamburg, manufacturer of precision balances. These balances have since been in use in the laboratory.

The better one of these balances is shown in Fig. 1. Its case is of mahogany and the bottom plate of heavy, finely glazed white porcelain. The pillar and beam are of brass, while the wire of the hangers and the pointer are nickel-plated. The pans are of rock crystal. Considerable ingenuity has been shown in the construction of the balance beam to secure lightness combined with rigidity. The shape of the beam and also the arrangements for adjusting the position of the center of gravity and for balancing are shown in the cut. The balance is provided with a plumb-line to show when it is level. The knife-edges and planes are of agate. By means of small set screws that hold the former in place, their position can readily be adjusted. Instead of lowering the beam so that the middle knife-edge rests on the central plane, as is the case in most chemical balances, the central plane is raised up against the middle knife-edge, thus lifting the beam from the steel edges (see cut) upon which it rests when the balance is not in use. To admit of this the central agate plane is fixed upon a steel rod that slides inside of the main brass pillar. This rod is moved by means of an eccentric fixed on a horizontal rod underneath the balance. The latter rod, upon which are also two other eccentrics that move the pan-supports at the same time that the beam is lifted, is turned by means of a small crank at the left. These pan-supports are brass rods tipped with agate; they slide in brass sockets. The small pins on the upper part of the hangers, as well as the sockets into which they fit when the balance is at rest, are also of agate.

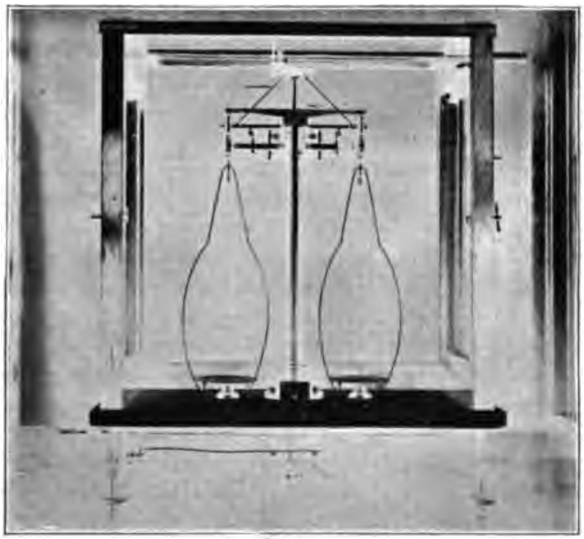

Fig. 1.

The scale on the beam is divided into ten equal parts, the zero being at the extreme left. Each division is again divided into tenths. The rider weighs five milligrams and the arrangement for moving it is particularly convenient. The balance will bear a load of two hundred grams. It turns readily with an overweight of one-tenth of a milligram, and tests have shown that its sensibility is very nearly independent of the load on the pans. The workmanship throughout is substantial and well executed. The balance is characterized by simplicity in the construction of its parts. Thus far it has given entire satisfaction.

The other balance is shown in Fig. 2. It is constructed on the same general plan as the one just described. With a few exceptions its parts are made of the same material as those of the balance in Fig. 1. The agate parts are the knife-edges and planes. The bottom plate is of black porcelain. The pans are nickel-plated, and the hangers are somewhat different in shape, as shown in the cut. The beam is heavier and of different shape and construction (see cut). The divisions on the beam are the same as on the balance in Fig. 1. A rider weighing fifty milligrams is used.

The balance will bear a load of two hundred grams. It is intended to weigh accurately to one milligram. It turns very readily for an overweight of one milligram, and its sensibility has been found to vary but very little with the load on the pans. The balance is intended for the less accurate work of the laboratory. It is well enough made, however, to allow one to estimate the tenths of a milligram from the oscillations. This balance too is simple in construction; its parts are well made and promise to be durable. The balance has thus far given satisfaction in actual use.

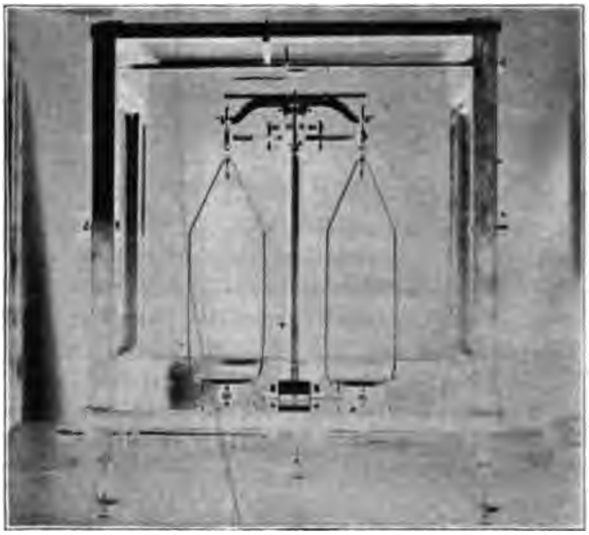

Fig. 2.

The photographs for the two cuts were kindly prepared by Prof. J. G. D. Mack of the Engineering Department of the University of Wisconsin.

Lab. of Pharm. Technique,
University of Wisconsin.

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Oil from Tsuga Canadensis *Carriere.*

(*Hemlock Oil.*)

By *Carl G. Hunkel.*

In an interesting contribution, entitled *Beitrag zur Kentniss der Fichtennadeloele,** Bertram and Walbaum report on the composition of an oil, called by them *Canadisches Tannenoel* (Spruce oil), and supposed to be derived from *Abies canadensis* L. With regard to its source they make the following additional statement: "Das *Spruce oil* wird aus den Nadeln und jungen Zweigen der in Nordamerika einheimischen Hemlocktanne dargestellt."

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* Archiv. f. Pharm. 231, p. 294.

That there is a mistake somewhere is quite evident. Dr. F. B. Power, in his excellent Descriptive Catalogue of Essential Oils and Organic Chemical Preparations, makes the following statement under the heading of the true Oil of Spruce* (p. 74.) "This oil of spruce is apparently the product which was examined in the laboratory of Messrs. Schimmel & Co., Leipzig, and designated as *Hemlocktannen Oel* with reference to its supposed botanical source from *Abies canadensis* Michx., which is popularly known in America as Hemlock Spruce. The latter, however, is believed to be the source of commercial oil of hemlock, which is probably similar in composition to the true oil of spruce."

True Spruce oil from *Picea nigra* Link of undoubted source was examined by the writer last year.† It was found to contain 48.85 p. c. of laevogyrate bornyl acetate, which up to that time was probably the largest percentage of this ester found in a volatile oil.‡

In the latter part of September 1894, the writer collected the leaves and twigs of the true hemlock, *Tsuga Canadensis* Carriere, better known in pharmaceutical literature as *Abies Canadensis* Michaux, at the dells of the Wisconsin river. The material was identified by Mr. L. S. Cheney, instructor in pharmaceutical botany at the University. This material was distilled with water vapor immediately upon arrival at the laboratory, but the yield was comparatively small. The oil possessed a yellowish color and the characteristic odor of hemlock. The sp. gr. of the dried oil was 0.9288 at 20°; its $[\alpha]_D = -18.399°$ at the same temperature.

Distilled under a pressure of 30 mm. the oil yielded a fraction, which boiled between 121-125°. This appeared to be almost pure bornyl acetate, though it contained sufficient of the offensive odoriferous principle of the hemlock oil to distinguish it from synthetic bornyl acetate in odor. The sp. gr. of the fraction was 0.9819 at 20°, $[\alpha]_D = -17.228°$.

A small quantity of oil was saponified with an excess of alcoholic potassa of known strength; the excess of potassa was titrated back with $\frac{N}{1}$ sulphuric acid. The ester was calculated as bornyl acetate. In one instance 52 p. c. in another 51.5 p. c. of acetate were obtained. The yield of acetate, therefore, is even somewhat greater than that of the oil of black spruce. The slight difference in percentage, however, may be accounted for by the difference of almost two months in the time of collection; the material from the black spruce being collected early in August, that from the hemlock late in September. The observation has been made that the cones of the balsam fir, which were fairly rich in volatile oil in early August, yielded no appreciable amount of oil when collected and distilled late in September. A partial modification of the pinene of the oil of hemlock rendering the same non-volatile could easily be made to account for the somewhat higher percentage of bornyl acetate.

A large portion of oil, including the non-bornyl-acetate fraction of the quantity distilled under diminished pressure, was saponified with caustic potassa and distilled with water vapor after saponification. Oil distilled over at first but later borneol separated in the condenser. The borneol that could be collected mechanically was dried and recrystalized from petroleum ether. The hexagonal plates resulting melted at 203¼° C. They were laevogyrate, $[\alpha]_D$ being $-8.6°$.

The oily distillate was separated, dried and fractionated, the following fractions being obtained:

a. —155°
b. 155°—160°
c. 160°—165°
d. 165°—170°
e. 170°—175°
f. 175°—185°
g. 185°—195°
h. 195°—215°
i. 215°+

Fractions e, f and g contained large amounts of borneol and the residue in the flask (i) was almost pure borneol. Fraction 155°-160° (b) was the largest. Its sp. gr. was 0.8658 at 20°; $[\alpha]_D = -21.18°$. Fraction 160°-165° had a sp. gr. of 0.8689 at 20°; $[\alpha]_D = -23.178°$. The borneol was removed from the higher fractions by submitting them to the temperature of a freezing mixture. The oil thus deprived very largely of its borneol was several times fractionated. In this manner a fraction 156°-158° was obtained with a sp. gr. of 0.8635 at 20°, and an $[\alpha]_D = -20.534°$. From this fraction the nitrosochloride was prepared in the usual manner, a yield of about 18.3 p. c. being obtained. The melting point was rather high, viz. 107°. From the nitrosochloride the nitrolbenzylamine base was prepared, which was found to melt at 122°.

The acetic acid was identified in the usual manner. The sodium and silver salts were prepared. The latter upon ignition yielded 64.1 p. c. Ag.

Oil of hemlock distilled in September therefore, consists principally of about equal parts of laevogyrate bornyl acetate and l-pinene. Other substances may be present in small quantity, but could not be isolated from the quantity of material available for this examination. There certainly is a small amount of a strong odoriferous substance present, which gives to the oil its peculiar odor, and which distilled over at least in part with the bornyl acetate when the oil was fractionated under diminished pressure.

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* *Picea alba* Link (White Spruce) or *Picea nigra* Link (Black Spruce).

† Pharm. Rundschau, 13, p. 136.

‡ Schimmel & Co's. Bericht, Oct. 1895, p. 21.

This oil of hemlock, therefore, is very similar in composition to that examined by Bertram and Walbaum, and to the oil of black spruce examined by the writer. A small quantity of oil of white spruce has also been obtained, but not sufficient for examination.

Pharm. Chem. Lab.,
University of Wisconsin.

MONTHLY REVIEW.

Commercial Reports.

Semi-Annual Report of Schimmel & Co. (Fritzsche Bros.), Leipzig & New York.

NOVELTIES.

Celery Oil from green leaves. The same reasons which led us to distill parsley oil induced us to grow a large quantity of celery this summer and to distill the green leaves. The result was an oil which resembled that obtained from the seed only in name, being as unlike to it as possible in all other properties of practical interest. The leaf oil possesses in its entirety the beautiful, powerfully-aromatic odor and the taste of fresh celery leaves and may arouse considerable interest, especially among manufacturers of concentrated soups, and preserved meat and vegetables. The oil-yield of the leaves was 0.1 per cent., representing a comparative strength of the oil to the green leaves equal to 1:1000. We have incorporated celery-leaf oil in our October price list. At present only a few pounds of the article are in stock, but next summer we can place it upon the market in any desired quantity.

The oil is of thin consistency and greenish-yellow color. Its physical constants are as follows: Sp. gr. 0.848 at 15°, opt. rot. + 52° 10′ at 24°. It is soluble in 10 parts of 90 per cent. alcohol.

Essential Oil from Chian turpentine. Essential oil from Chian turpentine has already been prepared by FLÜCKIGER, who refers to it at length in "Pharmacographia." This variety of turpentine is produced in the island of Chios in the well-known manner, by incisions in the trunk of *Pistacia terebinthus* L. The total annual production is said to amount to only about 2 cwts. We have distilled a few pounds of the turpentine by way of experiment and obtained about 14 per cent. of an oil possessing an odor resembling that of mace, camphor, and pinene. This yield is almost the same as that obtained by Flückiger, and the specific gravity of our oil (0.868) also closely approaches that of Flückiger's specimen (0.862). The optical rotation, however, shows a more considerable difference. Flückiger records it as + 11.5°, whereas we found it to be + 19° 45′. The oil is not of any practical interest.

Indian-hemp Oil. VIGNOLO (Gazz. chim. 25, 110) has obtained an essential oil by subjecting the flowering twigs of *Cannabis Indica* to steam-distillation. The oil is of a thin consistency, possesses an agreeable aromatic odor, a boiling point between 248—268°, and does not congeal when cooled down to — 18°. Distillation over sodium yielded a fraction boiling constantly at 256°, which was recognized as a sesquiterpene ($C_{15}H_{24}$) by ultimate analysis and determination of vapor density. No crystalline hydrochloride could be obtained from it.

This communication induced us recently to distill a small parcel of *Herba cannabis indicae*—without flowers, however. The oil yield amounted to 0.1 per cent. The oil possessed a narcotic, though not disagreeable, odor, it is limpid and does not acquire a buttery consistency at 0°. Its sp. gr. was 0.932.

Melissa Oil from green herb. In our Reports of April, 1891, and October, 1894, we referred at length to the difficulty and costliness of preparing a pure melissa oil; and expressed our intention to make experimental distillations with green material cultivated by ourselves, the manipulation of dried herb having given negative results. These distillations have been made this summer, two different varieties of melissa being employed, viz:

1. Green herb (leaves and stalks) in the beginning of the flowering period. The oil yield was exceedingly small: 0.014 per cent. Specific gravity of the oil 0.924. Opt. rot. + 0° 30′. The oil had a pleasant melissa-like odor.
2. Green herb in full flower. Oil yield 0.104 per cent. Specific gravity of the oil 0.894. Oil optically inactive. The odor is not so pleasant as that of the first-mentioned sample. The presence of citral and citronellal in the oil is plainly indicated by the odor.

Attempted estimation of the aldehyde by DOEBNER'S process produced no definite result, as the acids contained in the oil commenced to melt (in both samples) at about 208°, and only liquefied completely at 225°. We have probably to deal, in this case, with a mixture of the citral-compound (m. p. 197—200°) and the citronellal-compound (m. p. 225°).

The experiments in the distillation of green melissa herb have therefore failed to produce useful results. A pure essential oil from the green herb would be so costly as to preclude altogether its practical employment. But if, as our investigations seem to indicate, the presence in the oil of citral and citronellal may be considered fairly certain, the indirect result of our work would seem to be the probability that a suitable combination of these two bodies may give a substitute for pure melissa oil.

Parsley Oil from green leaves. The circumstance that the parsley oil of commerce, distilled from the seed of the plant, only possesses in a slight degree the genuine odor and taste of parsley, induced us to make an attempt on a somewhat large scale with the distillation of the green herb. The herb used was grown by us on our own plantations at Miltitz. Distillation produced a splendid oil, possessing entirely the natural odor of fresh parsley. This oil may be found very useful in the manufacture of preserved foods or condiments. The oil-yield of the leaves was 0.06—0.08 per cent., consequently one part by weight of oil possesses the intensity of about 1650 parts of green parsley. We have added the oil to our price list, and if it should find a market we can make arrangements for its preparation on a wholesale scale next year.

The oil has thin consistency and a greenish-yellow color. Its sp. gr. is 0.923 at 15°, and its optical rotation + 3°10′ at 28°.

Fractional distillation in vacuo gave the following results:—

at 68— 75°	at 13 mm...........	2 ccm.
" 75— 78°	" 13 "	4 "
" 78— 85°	" 12 "	10 "
" 85— 96°	" 12 "	10 "
" 96—135°	" 12 "	3 "
" 135—160°	" 12 "	8 "
" 160—170°	" 12 "	2 "

About 15 ccm. remained in the flask, and congealed in a freezing mixture. The boiling point of apiol being about 155° at 12 mm, the bulk of that substance would be contained in the sixth fraction. According to ZEIZEL's methoxyl determination

0.4813 g. oil yielded=0.1973 g. AgI representing 15.17 per cent. of apiol in this fraction. In the fifth fraction

0.3552 g. oil yielded=0.0489 g. AgI corresponding to 4.78 per cent. of apiol in this fraction.

Silaus Oil. This oil, which is obtained by distillation from the fruit of *Silaus pratensis* Bess., an unbelliferous plant which grows wild in Saxony, possesses an odor strongly reminding of estragon (tarragon), but will scarcely be suitable for practical use, as neither its odor nor taste can be called agreeable.

The fruits, distilled with the umbels, yielded 1.4 per cent. of an essential oil of 0.982 sp. gr. The opt. rot. is +0.7° at 20° in a 100 mm tube, the saponification figure was found to be 20.8. When the oil is subjected to cold a stearoptene separates out from it in the form of fine needles.

Menthol. Referring to our Report on Japanese peppermint oil we must also hold out the prospect of higher prices for menthol. For the present, owing to the fact that we own a large stock of cheap raw material, we make no change in our prices. The difference in cost between crude menthol and our re-crystallized pure menthol is too small to cover our expenses. At the present time crude menthol cannot be had below 13/6 per lb. Its re-crystalization causes a loss in weight of about 10 per cent.

The latest issue of the Therapeutischen Monatshefte (No. 9) contains, under the heading:—"Practical notes and useful Formulae" a lengthy report by Dr. REINHOLD WÜNSCHE of Dresden, "on the use of menthol in colds and influenza." The author refers to the statement of ZIEGLER, who showed that peppermint oil, even in a dilution of 1:3000 arrests the development of the comma bacillus, and that, according to KOCH, at a strength of 1:2000 it possesses the power of destroying the bacillus of cholera. RÖNICKE's valuable investigations have shown that the vapour of menthol alone is sufficient to arrest the development of staphylococcus pyogenes aureus and other dangerous bacteria.

In regard to the use of menthol as a remedy for colds, Wünsche expresses himself as follows:—

"Perfumes have often been succesfully used as remedies against colds, from HAGER's well-known specific with acid. carbolic. down to Eau de Cologne. According to ROUX a similar preparation is administered in the Hôtel Dieu at Paris in cases of cold in the form of energetic inhalations through the nose and mouth. It is said that this application has been uniformly successful in arresting the progress of the complaint, even with patients in whom tracheo-bronchitis always accompanied a cold. I am personally able to vouch for the favorable effect of Eau de Cologne in the initial stage of coryza. As I used to be a frequent sufferer of acute catarrh of the upper air-passages and of true influenza, I have probably experimented on my own person with every remedy that has been prescribed against these complaints.

I have always found menthol, dissolved in chloroform, to be the most efficacious of all remedies.

A solution of 1 to 2 parts of menthol in 20 parts of chloroform will not only arrest the progress of a cold in its initial stage, but is also an excellent influenza prophylatic.

From 4 to 6 drops of the solution should be placed in the hollow of the hand, quickly rubbed between the hands, the two hands tightly pressed together, placed before the face, and the remedy energetically inhaled alternately through the nose and mouth.

It will be immediately noticed that the volatile parts of the solution thoroughly impregnate the mucous membranes of the nose, mouth and throat and even penetrate deep down into the air-passage. During the first two or three inhalations the sweetish chloroform-vapor predominates, afterwards, however, only menthol, in an attenuated condition, is inhaled, odor and feeling remaining apparent for some time after the inhalation.

As a rule, the first inhalation suffices to cure the severest tendency of sneezing, and often to arrest the progress of the cold altogether. Two further applications of the remedy in the course of the day suffice to repress the attack completely.

The first inhalation at first slightly increases the flow from the mucous membrane of the nose; afterwards, however, this symptom diminishes quickly.

Pains in the pharynx and larynx may be quickly eased, and often entirely cured by the remedy.

When, a few months ago, the influenza made its re-appearance, I preserved myself and my family from the epidemic by means of chloroform-menthol inhalations, and this in spite of the fact that I was brought in frequent contact with sufferers from influenza, and that I had fallen a victim to the complaint on every previous occasion of its appearance.

If I should obtain no other satisfaction from these lines than that of having again called the attention of my professional brethren to the usefulness of menthol in cases of acute catarrh, I shall have rendered a service to large numbers of sufferers.

A small vial, containing about 5.0 grammes of chloroform and from 0.3 to 0.5 grammes of menthol should be kept as a cheap and reliable remedy in every household."

Safrol. The latest Reports reviewed from Japan state that camphor oil (which forms the raw material in the preparation of safrol) is becoming scarcer and scarcer, and that small parcels brought to market realized a decided advance in price. It is very likely that the quotation for safrol will soon be raised.

We here beg to give an abstract of a paper by A. **Heffter** (Archiv für experim. Pathologie etc. 35, 342) on the behaviour of safrol and its physiological action on the animal organism. The author states that only a small proportion of the safrol which is introduced into the animal organism is oxidized and may be recovered from the urine in the form of piperonylic acid. The major portion is exhaled through the lungs and leaves the body in the same form in which it was introduced. No glycocoll compounds could be discovered in the urine.

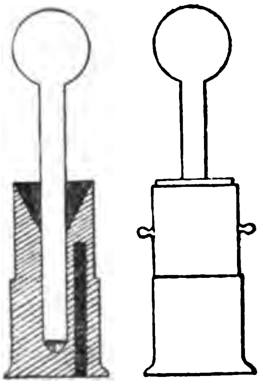
When administered in large doses by the stomach, and particularly when injected into the veins in the form of an emulsion, safrol exercises a powerfully toxic action, which manifests itself chiefly in symptoms of paralysis. Experiments on rabbits showed that the first organ to be affected was the brain, next the nerve centres ceased to act, and finally the breathing apparatus stopped and death ensued.

Remarkable effects resulted from the repeated injection of 1 ccm. doses of safrol in cats. The animals always died after a few days. Dissection revealed a condition of pronounced fatty degeneration of several organs, especially of the liver and kidneys.

Large doses of iso-safrol act similarly to safrol, only weaker. The effect is entirely different, however, when small doses are given repeatedly. The fatty degeneration observed in the case of safrol-poisoning does not occur, on the contrary, the animals generally die from want of the power to assimilate food. Nervous symptoms, such as vertigo, spasms etc., which do not usually occur in safrol-poisoning, were observed with iso-safrol.

Pharmaceutical Technique.

New Suppository Press.



A new suppository press has recently been patented by Ph. H. Schürer of Prague (Austr.), and recommends itself by its simplicity. The principle of this machine can easily be seen by glancing at the accompanying figures. The suppositories are quickly prepared by introducing the mass into the hollow cylinder and compressing it with a twisting downward pressure of the piston. They are then easily taken out by removing the metal cylinder and sliding apart the two halves of the mould.

[Pharm. Zeit., 1895, p. 735.]

An Ointment Mill.

A new mill for grinding ointments has been constructed by A. Zemsch in Wiesbaden. The mill is charged automatically with the fat. The pressure can be regulated so that fats of hard or soft consistency can be ground with equal facility. The machine is constructed in different sizes and can be used for grinding chemicals as well.

[Apoth. Ztg. 10, p. 885.]

A New Pharmaceutical Filter.

Böhm's patented handfilter, especially adapted to the wants of the pharmacist, is shown in the accompanying figure. Into the slightly conical upper portion of the enameled filter-funnel, a finely perforated enameled disk is introduced. Upon this is placed an aluminum sieve to support the filter-medium, which consists of chemically pure plant-fibres (probably paper-pulp) which are distributed uniformly over the sieve. The filter-medium comes in the form of white compressed cakes, which are boiled in water, and the resulting thick magma is used. To prevent the rising of the filter-mass when the liquid is poured on, it is covered with a flannel disk and an enameled plate. The filter is especially adapted for the filtration of tinctures, juices, liquors, fixed oils, etc.

[Pharm. Zeit., 1895, p. 735.]

Chemistry.

Boric Acid in Acidemetry.

E. P. Pennan and W. John recommend boric acid for the titration of acids. One molecule of borax is neutralized by one molecule of sulphuric acid when methyl orange is used as indicator. The advantage of the borax solution lies in the fact that in well stoppered bottles it can be kept without change. Boric acid does not act on methyl orange and the final reaction is sharp.

[Chem. News 71, p. 296.]

Estimation of Sugars by means of Copper-potassium carbonate Solution.

The unsatisfactory results formerly obtained by means of this reagent have been corrected by making a slight change in the composition of the solution. According to H. Ost, the improved solution is prepared by dissolving 17.5 g. crystallized copper sulphate, 250 g. of normal potassium carbonate, K_2CO_3, and 100 g. acid potassium carbonate, $KHCO_3$, in sufficient water to make a liter. Such a solution was found to give satisfactory results even after standing three and a half years. A table of sugar equivalents will be found in the original.

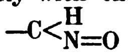
[Chem. Ztg. 19, pp. 1784 and 1829.]

On the Chemical Composition of several Volatile Oils.

A. C. Chapman has prepared several derivatives of humulene, a sesquiterpene from oil of hops. A nitroso chloride was prepared and from this a nitrol benzylamime base. The nitrosate, which melted at 162—163° was converted into a nitrol piperidine base. A nitrosite was obtained in two modifications: a blue one melting at 120—121° and a colorless one melting at 166—168°. The former is converted into the latter by repeated crystallization from alcohol. The author states that his nitrosate resembles the caryophyllene nitrosate obtained by Wallach.

The most interesting observation is the change of the blue nitrosite into the colorless modification.

This seems to be the first instance in which a compound apparently with the group



$$-C\begin{array}{l}\diagup H\\ \diagdown N{=}O\end{array}$$

has beeen isolated.

[Journ. Chem. Soc. 1895, p. 780.]

A. Reychler has isolated from cananga essence a substance that appears to be identical with linalool, and another which he pronounces to be the methyl ether of para methyl phenol.

[Bull. Soc. Chim. (3) 13, p. 140.]

Disinfection of Plants.

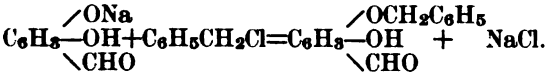
(G. I. P. No. 83058.)

In order to counteract the detremental effect of formic aldehyde (formaline) on plants they are exposed to ammonia vapors, which decomposes the formic aldehyde. The plants are placed in a cylinder into which first the vapors of formic aldehyde are passed, then those of ammonia. It is claimed that the ammonia combines in the cells with the formic aldehyde forming here a methylene tetramine, and that this has a beneficial effect on the growth of the plants and the capacity for germination of the seeds.

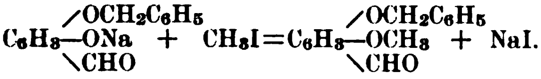
[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 940.]

Preparation of Vanillin and its Homologues.

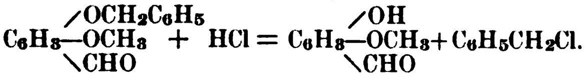
The *Chemische Fabrik auf Actien* has had several new processes patented according to which vanillin and its homologues can be prepared. The monosodium salt of protocatechuic aldehyde is converted into the para benzyl ether (OC_7H_7:CHO =1:4; m. p. 122°) and then methylated. This vanillin benzyl ether is heated with hydrochloric acid, which resolves it into vanillin and benzyl chloride.



$$C_6H_3\begin{array}{l}\diagup ONa\\ -OH\\ \diagdown CHO\end{array}+C_6H_5CH_2Cl=C_6H_3\begin{array}{l}\diagup OCH_2C_6H_5\\ -OH\\ \diagdown CHO\end{array}+NaCl.$$



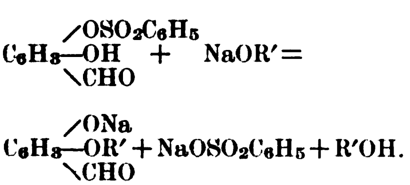
$$C_6H_3\begin{array}{l}\diagup OCH_2C_6H_5\\ -ONa\\ \diagdown CHO\end{array}+CH_3I=C_6H_3\begin{array}{l}\diagup OCH_2C_6H_5\\ -OCH_3\\ \diagdown CHO\end{array}+NaI.$$



$$C_6H_3\begin{array}{l}\diagup OCH_2C_6H_5\\ -OCH_3\\ \diagdown CHO\end{array}+HCl=C_6H_3\begin{array}{l}\diagup OH\\ -OCH_3\\ \diagdown CHO\end{array}+C_6H_5CH_2Cl.$$

According to another process vanillin can be obtained from eugenol and isoeugenol in a rather round-about manner. For details see the original.

The homologues of vanillin can be obtained from p-benzene sulphoprotocatechuic aldehyde or its salts by treating the same with sodium alcoholate.



$$C_6H_3\begin{array}{l}\diagup OSO_2C_6H_5\\ -OH\\ \diagdown CHO\end{array}+NaOR'=$$

$$C_6H_3\begin{array}{l}\diagup ONa\\ -OR'\\ \diagdown CHO\end{array}+NaOSO_2C_6H_5+R'OH.$$

[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 878.]

Compounds of Amidoguanidine and Sugars.

Amidoguanidine was introduced as a reagent for carbonyl oxygen only a year or two ago. Baeyer used it successfully as a reagent in his researches on terpenes and derivatives. It is now also applied in the study of sugars. Crystalline derivatives of glucose, galactose and milk sugar have thus far been prepared by H. Wolff.

[Ber. d .d. Chem. Gesellsch., 28, p. 2614.]

Botany and Pharmacognosy.

The Action of Hydrogen Sulfid on Plants.

Experiments by Barnouvin on strawberry plants showed that hydrogen sulfid acts as a poison to plants as well as to animals. The leaves show yellow spots and later the death and complete drying up of certain parts of the leaves follow, when they are exposed for several days to the action of a mixture of this gas and atmospheric air. On being returned to pure air, they gradually recover. If they are exposed in a close space to the action of the pure gas, in twenty-four hours the leaves become brown or black, dry up and die.

[Répert. de Pharm., 1895, p. 386, and Pharm. Centralb., 36, (1895) p. 702.]

The Translocation of Calcium Phosphate in the Plant.

During the development of the seed as is well known, the mineral elements of the plant wander from leaf and stem to the seed, and, during germination, travel out into the seedling. The transportation of soluble materials such as the sugars, is easily understood. How this takes place with insoluble substances such as the phosphates is the subject of an investigation by M. L. Vaudin. From the author's experiments, it appears that at the time of harvest, only traces of succinic acid are found. During germination, however, hydration- and oxidation-changes occur, the starch granules are changed to sugar, the succinic acid disappears, giving place to malic acid, the salts of which alone are found during the vegetative period which precedes the development of seeds. During the process of ripening, when the young grain is in the "milky" stage, succinic acid again appears, probably as a result of the reduction of the malic acid. As the author has previously shown, the sugars are able in the presence of malic salts to hold calcium phosphate in solution, whereas the salts of succinic acid do not possess this ability. Accordingly, the sugars formed in the leaves wander to the seed and the alkali salts of malic and phosphoric acid carry with them insoluble phosphates. Upon the change of the sugars to starch, they drop the basic lime salts; at the same time the malates are almost completely broken down and are changed in small part to succinates. The rôle played in the *Gramineæ* by the malates is taken in other families, particularly in the *Leguminosæ*, by the citrates

[Chem. Zeitung, 1895, p. 335, and Pharm. Zeitung f. Russland, 34, (1895) p. 710.]

The Adulteration of Ground Pepper.

In order to detect ground olive seeds, the shells of almonds and of other nuts, as well as of all similar lignified materials, Martelli makes use of the microchemical reaction for lignin recommended by Wiesner, phloroglucin. He dissolves about 1 gr. phloroglucin in 50 to 60 cc. hydrochloric acid (sp. gr. 1.1) by allowing it to stand 1 to 2 days. In a flat porcelain dish, he puts 0.5g. of the pepper to be investigated, moistens the same with the turbid phloroglucin solution and warms cautiously until vapors of hydrochloric acid are given off. By this treatment, bodies containing lignin assume a strong cherry-red color which can be detected by the unaided eye, while the particles of pepper assume colors varying from a yellowish to a reddish-brown. By washing and decanting, a reddish violet powder remains consisting almost entirely of the foreign substances.

[P. Staz. Spermient. Agrar. Ital., (1895), p. 53, and Pharm. Centralh., 36, (1895), p. 701.]

The Source of the Toxic Action of Arum maculatum, *L.*

After reviewing the literature bearing on the source of the toxic action of *Arum maculatum*, L., Dr. Aug. Schneegans reports results of his own investigations favoring the view that it lies in the presence of saponin as contended by Waage (1), and Spica and Biscaro (2), and not in the action of needle-shaped crystals of calcium oxalate as thought by Greshoff (3). After describing the method of treatment yielding saponin, the opinion is expressed that the therapeutic effectiveness of this plant is to be ascribed to this body.

The favorable action of *Arum* (*Arisæma*) *triphyllum* in catarrhal troubles as observed in North America is thought to be probably also due to contained saponin. In this connection may be cited the observation of Barnes (4) that the juice of this plant loses its acridity on filtering out the raphides.

Attention is called to the fact that both *A. maculatum* and *A. esculentum* when prepared by carefully washing out the harmful principle serve as food. The latter species is one of the important sources of nutriment in the Polynesian Islands where the tubers contain as high as 33 per cent starch. A somewhat analogous case is seen in the manioc plant (*Manihot utilissima*) which on careful washing and heating yields the tapioca of commerce.

[Journ. d. Pharm. v. Elsass-Loth., 22, (1895), p. 295.]

Occurence of Methyl Salicylate in Species of Polygala.

To the number of species of *polygala*, yielding methyl salicylate, P. van Romburgh has added one more, viz. *Polygala variabilis albiflora*. The same ester has been found in the roots of *P. Senega* L., *P. alba*, *P. tenuifolia*, *P. oleifera* Heckel and *P. javana*.

[Rec. trav. chim. des Pays-Bas, 13, p. 421.]

The Carbohydrates of the Gum of Acacia decurrens.

According to W. E. Stone this gum resembles gum arabic and cherry gum not only as to outward appearance, but also as to chemical composition. The solution of the same is slightly acid and is optically laevogyrate. Lead acetate and alcohol produce produce precipates. The carbohydrate is of the character of a galacto-arabene. Hydrolysis yields arabinose and galactose.

[Am. Chem. Journ. 17, p. 196.]

Preparation of Guttapercha.

The preparation of guttapercha from leaves was described in this journal (p. 19). *H. E. Sérullas* of Paris has recently had an improved method of extraction patented. Before the guttapercha is extracted the leaves are digested with a three percent solution of alkali under pressure. The tissue is thereby destroyed, thus facilitating the extraction of the guttapercha with toluene or benzene.

[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 1035.]

Practical Pharmacy.

Multiplication of Remedies.

Some time ago a protest was made in the Pharm. Zeitung against the flooding of the market with preparations, that, when deprived of their high-sounding names, appear as old acquaintances, or as more or less superfluous derivatives of well-known medicinal substances; superfluous, because they do not excel these except in a higher-sounding name, or perhaps in price. The list of medicines containing antipyrin, already large and constantly increasing, shows well the tendency of inventors to enlarge our list of remedies, all of course, only in the interest of suffering humanity.

Antipyrin owes to its therapeutic success, as well as to the pecuniary benefits accruing to its manufacturers, the fact that it has again and again been brought out under new names. Up to the present time, the following titles have been applied to this substance: *Antipyrin*, *Analgesin*, *Anodynin*, *Metozyn*, *Parodyn*, *Phenazon*, *Phenylon*, *Pyrazin*, *Pyrazolon* and *Sedatin*.

Soon after antipyrin had commenced its triumphal march, one of our manufacturing houses conceived the happy thought of combining antipyrin with salicylic acid. The good results obtained with *Salipyrin* have, for the same reasons as with antipyrin, already given it several names (*Salazolon*, *Salipyrazolin*); at the same time their good results probably were the cause of that feverish search for other profitable discoveries in the chemistry of antipyrin, that was soon to follow.

Of the salts of antipyrin may be mentioned *Tussol*, (i. e., mandelate of antipyrin), which was so much advertised a short time ago. Perhaps e'er long we will see the hither-to neglected citrate of antipyrin in a new edition and with beautifully sounding name; for has not citric acid only recently proven itself so flexible in enriching the remedies of the phenetidin group (*Citrophen* and *Apolysin*), and surely the desire for imitations is scarcely anywhere greater than in the "domain of the synthetic remedies."

A very large field of action, to which special attention is hereby drawn, is furnished by the combinations of the phenols with antipyrin; as far as we know there are at present:

Phenopyrin, from Phenol and Antipyrin;
Picropyrin, from Picric Acid and Antipyrin;
Resorcinopyrin, from Resorcin and Antipyrin.
Resorcylalgin, from Resorcylic Acid and Antipyrin;
Pyrogallopyrin, from Pyrogallol and Antipyrin;
Naphtopyrin, from B. Naphtol and Antipyrin.

As to their application in medicine, things look rather dubious as yet with these, but the phenol group is large; surely some combination can yet be found of wonderful antirheumatic or antineuralgic actions.

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(1) Pharm. Centralh., 1892, No. 45—49 and Pharm. Centralh., 1893, No. 10.
(2) Annali di Chimica, Med.-Farm., 1885, p. 92.
(3) Pharm. Centralh., 1892, No. 51.
(4) Bot. Gaz., 13, (1888), p. 232.

Of course, simple mixtures also suffice, as the following indicate:

Antisemicramin, a mixture of antipyrin, caffeine and sugar;
Bromopyrin, a mixture of antipyrin, caffeine and sodium bromide;
Migränin, a mixture of antipyrin, caffeine, and citric acid;
Pelagin, a mixture of antipyrin, caffeine and cocaine.

Also the two latest remedies containing antipyrin,
Antipyrinsalol, made by melting together antipyrin and salol; and
Cocapyrin, a mixture of antipyrin with cocaine hydrochlorate,
belong to this latter category.

To be thorough, although refraining from mentioning any of the true substitution derivatives of antipyrin, we must add
Hypnal, (i. e., monochloral antipyrin),
Bichlor antipyrin,
Dehydrochloral antipyrin,
Ferro and *Ferripyrin*, (combinations of antipyrin with chlorides of iron);
whose right to exist cannot be questioned.

Whether there has been a real need for all these preparations, or whether the wants of medicine would not have been as well subserved with antipyrin and salipyrin (with possibly ferropyrin added), is a question which scarcely requires the decision of a therapeutist; an apothecary too can find the correct solution if he glances at his collection of rarities and antiquities, in which, besides numerous other short-lived remedies, many of the antipyrin-containing medicines may already be found. [Pharm. Zeit., 1895, p. 737.]

Iodoformin.

Iodoformin is considered by E. **Konteschweller** to be a combination of iodoform with hexamethylen tetramine [Pharm. Centralb., 1895, p. 46]. This latter preparation combines with iodoform, molecule for molecule, so that the resulting body contains 75% of iodoform, the same as does iodoformin. The author obtained this combination by treating an alcoholic solution of 70 gms. of iodoform with an alcoholic solution (1—14) of 30 gms. of hexamethylen tetramine, and drying the resulting precipitate between filters. The substance so obtained was in the form of a fine, white powder, odorless, but splitting off iodoform and acquiring the odor of this substance when brought in contact with water.

[Pharm. Zeit., 1895, p. 761].

Nicotiana Soap.

Tobacco wastes have been used extensively for the preparation of an extract, which is used on sheep in the treatment of skin diseases. Mr. **Mentzel**, an apothecary in Bremen, has prepared a soap containing tobacco extract for the treatment of parasitic skin diseases of man.

A sufficient quantity of tobacco extract, containing from 7 to 9 p. c. nicotine, is added to the soap so that the finished product contains 10 p. c. extract or about 0.7 p. c. nicotine. The resulting soap has a brownish-black color and is perfumed with bergamot oil.

[Pharm. Centrh. 36, p. 745.]

Detection of Asaprol.

Asaprol or Abrastol, the calcium salt of naphtosulphuric acid, is said to be used extensively for the preservation of foodstuffs and beverages. According to **Bellier** the presence of the same in wine can be determined according to the following method: 50 cc. of wine are rendered alkaline with ammonia and shaken with amyl alcohol, which dissolves the asaprol. The solution of amyl alcohol is evaporated on a water bath. To the residue 1 cc. of nitric acid and 1 cc. of water are added. The mixture is again heated until about 1 cc. remains. This is transferred to a test tube with the aid of a little water. 0.2 g. of ferrous sulphate is dissolved in the solution and slight excess of ammonia is added while shaking. Then 5 cc. alcohol are added and finally a few drops of sulphuric acid. The precipitate is removed by filtration. In the absence of asaprol the filtrate is colorless or of a slight yellow color, in the presence of the same the filtrate is colored more or less red.

Salicylic acid produces a similar color. The residue after the evaporation of the amyl alcohol produces a violet color with ferric chloride, which remains constant upon heating, if salicylic acid is present; whereas asaprol produces a blue color, which disappears upon boiling.

[Répert. d. Pharm., 1895, p. 106.]

New Method for the Estimation of Caffeine in Tea.

A comparatively simple and apparantly accurate method has been devised by **van Ledden-Hulsebosch**.

5 g. of the pulverized tea are mixed with 1 g. of calcium hydroxide and 100 cc. of water in a tared Erlenmeyer flask and heated for three hours on a water bath. Upon cooling, the original weight is restored and the mixture is filtered. In 50 cc. of the filtrate 0.5 g. of anhydrous sodium carbonate are dissolved. The resulting precipitate is removed by filtration and washed with a little water. The filtrate is evaporated to about 15 cc. This together with the water necessary to rinse the dish are transferred to a perforator and the combined liquids perforated with ether for three hours.

The caffeine, which results upon the evaporation of the ether, is snow-white and is dried at 100°. A specimen of tea, which according to Herlant's method contained 2.42 p. c. caffeine, yielded 2.58 p. c. The author intends to extend his method so as to include coffee, cocoa and cola.

[Pharm. Centrh., 36, p. 742.]

Food Stuffs.

Changes in the Chemical Composition of Wine caused by the Addition of Alum.

According to F. **Sestini** the addition of alum to wine is accompanied by the gradual formation of a precipitate, which consists principally of aluminium phosphate. The addition of alum to wine can, therefore, not be recognized by the presence of an unusually large amount of aluminium, but rather of sulphuric acid and of volatile acids. In as much as the addition of alum causes the abstraction of phosphoric acid and a substitution of sulphuric acid in place of the former, it should not be permitted.

[Gazz. Chim. 25, II, p. 257.]

Detection of Formic Aldehyde in Milk.

According to R. Thompson a forty per cent formalin solution is four times as strong as a milk preserving agent than boric or salicylic acids. It can therefore be used advantageously to preserve milk for chemical analysis, but should not be added to milk intended for consumption.

To detect formic aldehyde in milk 100 cc. of the latter are distilled until 20 cc. of distillate are obtained. About five drops of ammoniacal silver nitrate solution, containing about 2 p. c. of silver nitrate and but a slight excess of ammonia, are added to the distillate contained in a flask provided with a glass stopper. The mixed solutions are set aside in the dark for an hour. If formic aldehyde is present the solution will become blackened or a black precipitate will be formed. The presence of 30 mg. of a 40 p. c. formalin solution in 1 liter of milk can be detected in this way. The distillate from pure milk remained unchanged even after 24 hours.

[Chem. News, 71, p. 247.]

Sanitation and Hygiene.

Ammonia in Drinking Water.

Dr. S. Paul Liechti has observed that corks have the property of absorbing ammonia from the atmosphere. In consequence, pure water that has been in contact with new, clean corks may produce a reaction for ammonia. Corks to be used as stoppers for jars or bottles containing water to be examined should, therefore, be boiled before they are used.

[Schweiz. Wochensch. f. Chem. und Pharm., 1895, p. 436.]

A Color-Reaction on a Large Scale.

In order to decide the source of a water supply, potassium fluoresceïn apparently will do better service than eosin. A very interesting description of its application is given by Dr. Jehn. 2 Ko. of potassium fluoresceïn traversed a distance of 8 km. underground in twenty-five hours and colored the *Ahn* beautifully green for twelve hours. Although in a test tube the fluorescence is visible in a dilution of 1 : 10,000,000 the dilution in the river was estimated to be about ten times greater.

[Apoth. Ztg., 1895, p. 831.]

Bacteriology.

A Red Pigment from Bacteria.

Under the name "Aug-Khak", the Chinese in Java and other of the Sunda Islands, the retail trade of which lies almost completely in Chinese hands, bring on the market a pigment for the coloring of foods which gives a very showy red color. Recently it has become known that this coloring-matter is prepared in a very interesting manner by the Chinese. It is by the propagation of certain bacteria which grow readily on all starch-containing substances. In China, particularly in the province of Canton, this microbe is cultivated on rice which has been ground and boiled. The freshly prepared rice is inoculated from an older culture, after which, in the course of six days, an abundant development of the pigment-forming bacteria is obtained. Growth takes place best in a cool, damp place and only in a good air supply, for which reason the rice preparation is spread out in plates in as thin layers as possible. Along with this form, other bacteria, however, develop. To hinder this, the Chinese add to the rice a small quantity of arsenic which kills the harmful bacteria without influencing the pigment-formers. The preparation of this coloring matter is a very old industry in China. It appears, therefore, that the Chinese in this supposedly modern practice of obtaining pure cultures for industrial purposes, were really our predecessors by some centuries. Of course, they arrived at this practice in a purely empirical way without any appreciation of the essential processes involved.

[Apoth. Zeit. 10, (1895) p. 916.]

Physiology, Pharmacology and Therapy.

A Physiological Andidote.

By mistake C. Binz injected into a patient four times the maximum dose of atropine. He soon noticed the mistake and injected a somewhat smaller dose of morphine. On the one hand the usual irritating effect of the atropine was not observed, on the other, the action of the morphine was very mild. In spite of the comparatively large dose the antagonistic effect of both alkaloids was demonstrated almost to perfection.

[Berl. klin. Wochenschr. 1895, p. 997; from Chemiker Ztg. 1895, p. 383.]

Prophylaxis and Therapy of Diphtheria.

Therapeutic serums are about in the same stage of development as were alkaloidal vegetable drugs at the beginning of this century before the discovery and isolation of the alkaloids. As a result even such physicians and therapists, as recognize the full value of the serum therapy, have not given up entirely the use of older remedies or the search for new ones.

Dr. N. Rosenthal [Therapeutische Monatshefte, 1895, p. 262] claims that ferric chloride, an old remedy against diphtheria, may be considered as a specific. He positively asserts that ferric chloride prevents the secondary larynx diphtheria, and that as far as a cure is concerned better results have been achieved than with any other remedy. Of 271 patients treated but 8.2% died. Even Loeffler is mentioned as one favoring the ferric chloride treatment.

Very striking results have also been obtained by Dr. S. Schwarz [Wiener klin. Wochenschr., No. 43, 1895] with sodium sozorodol by direct insufflation with a paper tubule. The total mortality, including patients received at a late hour or living under poor hygienic conditions, did not exceed 8—10%; whereas the mortality of patients treated immediately upon taking sick, was as low as 2—3%. Inasmuch as Behring's serum acts only on Loeffler's bacillus and not on streptococci, etc., and since the presence of Loeffler's bacillus can be ascertained only upon bacteriological examination, the value of a local antiseptic of general application is apparent. Furthermore it is ofttimes impossible to obtain fresh, reliable serum. Even those who can obtain the same and have the means of making a differential diagnosis, may use both serum and sodium sozorodol to advantage.

Hydrophobia and Vaccination.

During the year 1894, 323 persons who had been bitten were brought to the *Kaiserl. Inst. f. Experimental medizin* at St. Petersburg. Of this number 99 were not vaccinated, partly because the animals who had bitten them were healthy, partly for other reasons. Of the number treated three died of hydrophobia, the others recovered. The treatment lasted from seven days to more than a month.

In Odessa 1000 persons were treated according to Pasteur's method. The death rate was as low as 0.32 p. c.

[Apoth. Ztg., 1895, p. 848; from Arch. des Sciences Biolog., Tome IV., No. 1.]

The Hot Caves of Monsummano.

A short time ago general attention was called to a new method of healing, the frigotherapy of Prof. Raoul Pertet, which may result in the erection of a *Kälte Klinik* in Berlin. Attention is now being called to a therapeutic agent of the other extreme, viz. the hot caves of Monsummano, Italy. These caves were accidentally discovered in 1849 by laborers quarrying rock on the farm of Domenico Giusti, father of the Italian poet Giuseppe Giusti, whose satires were such an important factor in the political development of Italy. Laborers suffering from rheumatism found relief while remaining in the cave. The news of these accidental cures soon spread abroad. The grandduke of Tuscany came to see the miracle. Garibaldi and Kossuth were among the first patients who came to seek relief: the former from a wound received at Aspromonte, the latter from cephalalgia. Patients enter the cave clad only in a light white garb. The three larger appartments of the grotesque cave, which has been made accessible for a depth of 277 meters, are known as *il paradiso, il purgatorio* and *l'enferno* respectively. The temperature is about 31°C and the atmosphere is saturated with moisture, yet breathes freely. The rock is very porous and there appears to be an abundant circulation of pure air. After a few minutes the patient begins to perspire and soon perspiration begins to pour from all parts of the body. These baths last from half an hour to several hours. This treatment may readily be made to account for the fact that Monsummano, although highly interesting as an object of nature and full of mystery to the general public, has not become a fashionable summer resort. As the name of the second grotto indicates it rather appears to be an assembly for such men as have indulged too freely in some of the luxuries of life. Nevertheless the suffering poor may seek relief from rheumatism and the after effects of influenza as well as the penitent rich from gout.

A Double Antitoxin.

It has been known that in cases of diphtheria the disease is not always caused by the presence of the Loeffler bacillus only, but that streptococci often complicate the same. The diphteria antitoxin thus far prepared is a specific against the disease produced by the Loeffler bacillus, but is without effect on that form of the disease caused by the streptococci. European scientists have, therefore, experimented in the direction of preparing a serum having antitoxic properties against both the Loeffler bacillus and the streptococcus by immunizing the same animal against both poisons. The results of these experiments appear to have been successful if recent announcements prove correct. It is stated, that it requires a period of one year to immunize a horse against streptococcus, an immunizing power of 1:30,000 being reached.

Pharmaceutical Societies.

International Pharmaceutical Exposition.

The second international pharmaceutical exposition in Prague will be held from August 15, to September 15, 1896, in the *Haupt-Ausstellungs palast im Baumgarten.* The exhibits will comprise the following groups:

I. Scientific apparatus and appliances used in pharmacy and allied branches.
II. Pharmaceutical literature and literature of allied sciences.
III. Machines and apparatus used in the manufacture of pharmaceutical preparations.
IV. Equipment of pharmacies.
V. Drugs, chemicals and pharmaceutical preparations.
VI. Books, statistics, apparatus, utensils, etc., illustrating the historical development of pharmacy.
VII. Pharmaceutical corporations and societies.
VIII. Hygiene and care of the sick.
  1. Equipment of homes and utensils from a hygienic standpoint.
  2. Clothing.
  3. Foodstuffs.
  4. Disinfection, perfumery, chemicals for the purification of water and air, illumination, heating and ventilation.
  5. Articles of toilet with reference to health.
  6. Popular scientific treatises on hygiene, first aid in care of accidents.
  7. Hygienic equipment of hospitals and life-saving stations, sanitary appliances for the transportation of the sick.
  8. Bacteriological and microscopic preparations.
  9. Hygienic preventives.
  10. Mineral waters and their products.
  11. Balneology and gymnastics.

Further information can be had, upon application, from the chairman of the executive committee, Dr. K. Fragner, pharmacist in Prague, 203—III.

Congress for Applied Chemistry.

The second international congress for applied chemistry will be held next summer in Paris, also an exhibit of chemical and agricultural industry. There will be ten sections including medical and pharmaceutical chemistry.

Personals.

Mr. C. G. Lloyd, co-editor with Prof. J. U. Lloyd of "Drugs and Medicines of North America," is on a several months' tour to the Barbadoes Islands collecting fungi.

Dr. Hermann Hager.

On the third of January the veteran pharmacist of Germany celebrated his eightieth birthday. Possibly no pharmaceutical writer is more universally known among practicing pharmacists the world over than Hager. That self-made men are possible in Germany as well as in this country has been demonstrated by the career of this profuse writer. At the age of sixteen he left school and entered a pharmacy as apprentice only to learn that even in those good old times a pharmaceutical apprenticeship involved much unpleasant drudgery and practically little time for study. Yet circumstances forced him to resign all scientific aspirations for the time. The craving to learn something, and his great diligence, however, enabled him to pass successfully the state board examination at Berlin without having been able to attend a regular course of study at a university. Even as an apprentice he found time for literary activity and during the seventeen years while he was proprietor of a pharmacy he was constantly busy educating himself and writing. When he retired from active business it was done to have all of his time for his intellectual advancement and the writing of books or editing of journals. He founded and for twenty years edited the Pharmaceutische Centralhalle.

Work was his recreation and work was his delight. For a number of years he lived in the quiet of Bunzlau, but since 1883 he resides in Frankfurt on the Oder.

On the merits of his works the philosophical faculty of the University of Jena conferred upon him the degree of Ph. D., and the medical faculty conferred upon him the degree of M. D., *honoris causa*. Hager is not only honorary member of a number of European societies, but also of the American Pharmaceutical Association and several colleges of pharmacy, viz. those of Chicago, Massachusetts and Philadelphia.

Universities and Colleges.

Curator of the Fielding Herbarium.

By a recent decree of convocation of the University of Oxford, the office of Curator of the Fielding Herbarium has been duly constituted, and this has been followed by the election of Mr. G. Claridge Druce to the post. Mr. Druce, who is well known as a pharmacist and an examiner to the Pharmaceutical Society, is an honorary M. A. of the University of Oxford. He is also the author of a Flora of Oxfordshire, and is at present engaged in the compilation of a Flora of Berkshire.

Philadelphia College of Pharmacy.

The Philadelphia College of Pharmacy at a meeting held Dec. 30, elected Dr. Frederick Hoffmann as honorary member of the college.

Pharmaceutical Chemistry at the University of Berlin.

A part of the chemical laboratory of the *Landwirthschaftliche Hochschule* has been set aside as a pharmaceutical laboratory. The director of the same, Privat docent Dr. Thoms, will deliver courses of lectures on pharmaceutical and forensic chemistry, also on the chemistry of foodstuffs. The present arrangement is only a temporary one. It is rumored that the prospective pharmaceutical institute may find a permanent home in the new botanical garden of the university.

Jurjew (Dorpat).

Mag. J. Kondakow has been appointed extraordinary professor of pharmacy in place Prof. G. Dragendorff. The number of pharmaceutical students, or more correctly *Zuhörer der Pharmacie*, during the present semester is 237, against 277 last year.

Buda-Pest.

The university senate is of the opinion that such women as have had the required preparation, should be admitted to the study of pharmacy. The question whether women should be admitted to pharmacy has been freely discussed of late by the political press of Hungary. The Hungarian apothecaries' society has recently placed itself on record as being opposed to the admission of women to their profession.

In Memoriam.

Dr. Sickenberger, professor of botany and chemistry at the medical school at Cairo, Egypt, died in December of last year. He was known to pharmaceutical students principally through his articles on Arabian drugs.

Literary.

Books and Pamphlets Received.

Art. Institut Orell Fuessli—Zuerich. Commentar zur Pharmacopœa Helvetica, Editio Tertia. Von Dr. Carl Duennenberger, Apotheker. pp. XV, 428. 1896. $4.80.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médecine de Paris. Tome premier. 2^e Fascicule, pp. 337—672. Aliments—Aristote. 1895. 8 fr. 50 centimes.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet. Tome premier. 3e Fascicule, pp. 673—1046. Arloing (s)—Bactéries. Avec table des matières du premier volume. 1895. 8 fr. 50 centimes.

Wilhelm Knapp—Halle. Lehrbuch der praktischen Photographie. Von Dr. Adolph Miethe. 440 Seiten, mit 170 Illustrationen. 1896.

Bibliographisches Institut—Leipzig. Meyers Konversations-Lexicon. 5. Aufl., Bd. 10. Kaustik—Langenau. 1060 Seiten mit zahlreichen Illustrationen. 1895.

Vandenhoeck und Ruprecht—Goettingen. Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. H. Beckurts. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang.) Ein Bd. pp. VI, 894. 1895. $7.20.

Julius Springer—Berlin. Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Redigirt von Dr. A. Hilger, Professor an der Universität München. Zehnter Jahrgang. Das Jahr 1895. Drittes Heft. pp. 321—483.

P. Blakiston, Son & Co.—Philadelphia. Outlines of Materia Medica and Pharmacology. A text-book for students. By H. M. Bracken, M. D., Professor of Materia Medica, Therapeutics and Clinical Medicine, University of Minnesota. One vol., pp. 383. 1895. $2.75.

Author—Lavoisier. President's Address before the Indiana Academy of Science. By W. A. Noyes. Pamphlet, pp. 11.

University of Wisconsin—Madison. The Conn Culture (B 41) in Butter Making. Bulletin[*] No. 48 of the Agricultural Experiment Station. By E. H. Farrington and H. L. Russell. Pamphlet, pp. 22. 1896.

Reviews.

Commentar zur Pharmacopœa Helvetica. Editio tertia von Dr. Carl Duennenberger, Apotheker. Druck und Verlag: Art. Institut Orell Fuessli in Zürich, 1896, pp. XV, 428. $4.80.

The third edition of the Swiss Pharmacopœia which went into effect July 1st, 1894 was reviewed in a verry able manner by Dr. Charles Rice, (Pharm. Rundschau, 1894, pp. 63 and 82) whose duties as chairman of the Revision Committee of the United States Pharmacopœia especially qualified him for such a task. Calling attention to the excellent work of the publisher, Dr. Rice makes the following statement: "Jedenfalls sind weder Mühen noch Kosten gescheut worden, um dem Buche ein würdiges Aeussere zu geben. Keine andere bisher erschienene Pharmacopöe kann sich in dieser Hinsicht mit der hier besprochenen messen."

From the same publishing house, a commentary on the Swiss Pharmacopœia has now appeared. The above quoted sentences of Dr. Rice apply with equal force to this work.

The titles of those substances which are classed with the *Separanda* of the pharmacopœia are printed with red ink, e. g. *Acidum hydrochloricum*, *Extractum Strychni*, etc.; whereas, the titles of those substances which are enumerated as *Venena* are characterized by white letters on a black background, e. g. *Kalium arsenicosum solubum*, *Strychninum nitricum*, etc. The table of reagents is printed on red paper so that it can be consulted readily.

The striking features of this book, however, do not lie solely in the workmanship of the printer and publisher. Possibly less than any other pharmacopœial commentary does this one replace the pharmacopœia which serves as its basis. If the authors of the third edition of the Swiss Pharmacopœia profited by recent editions of other pharmacopœias, commentators of pharmacopœias the world over and particularly in this country can learn much from Dr. Duennenberger's work. The entire replacement of a pharmacopœia by a commentary does not only involve the ethical phase of authorship and copyright, but an educational factor as well.

The difference between this and other pharmacopœial commentaries is brought out very strongly in the omission of all mere description of vegetable and animal drugs. In as much as the commentator can improve but little, if any, on such descriptive portions of pharmacopœial text, there is little sense in reproducing the same. This is equally true of much of the text on galenical preparations. A general description of the process of preparing tinctures can be given under the general heading *Tincturae*. Consequently there is no need of reprinting the pharmacopœial text under every new heading, except where special differences from the general rule call for special comment.

It is quite different with the characterization of chemicals. This is partly positive, characterization as to identity; partly negative, characterization of impurities. Although it is generally taken for granted that such descriptions are self-explanatory this is by no means always the case. Dr. Duennenberger's commentary is therefore largely a chemical work. This chemical commentary does not only include the discriptions of chemical drugs, but of vegetable drugs as well, whenever the description is based on a chemical characteristic.

This explains in part the very liberal use made of structural chemical formulas. The other reason for the use of such formulas is to be found in the polyglot character of the Swiss pharmacist. The Swiss Pharmacopœia was published simultaneously in German, French and Italian. With the exception of a few paragraphs in French and Italian addressed to the French and Italian reader respectively, this commentary is written in German. The language of the chemical formula and equation, however, is not national, but international; it is understood by the French and Italian reader as readily as by the German.

The book is a credit not only to the publisher, but also to the author, the proprietor of the Anglo American Pharmacy of Zürich. It demonstrates once more that genuine scientific and literary work is not incompatible with the everyday duties of a practicing pharmacist. One may earnestly hope that the book will not only prove a source of instruction to the prospective pharmacist and a guide to the master, but a stimulus and even an inspiration to those who are at times discouraged by the general tendency toward commercialization of our calling. *E. K.*

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[*] The bulletins and annual reports of this station are sent free to all residents of Wisconsin who request it.

Dictionnaire de Physiologie par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome Premier, A–B, avec gravures dans le texte. Fascicule 1er pp. XI, 1–336. Ancienne Librairie Germer Baillière et Cie, Paris; Felix Alcan, Éditeur, 1895. 8 fr. 50 centimes.

The first volume of more than a thousand quarto pages covering little more than the letter A has been issued in three fascicles. Fascicle one, covering articles Abasie-Astasie—Aliments lies before us. In the preparation of this monumental work Prof. Richet is assisted by a force of thirty-seven colaborers, specialists in their respective fields.

The reasons for writing so extensive a treatise are briefly summarized by the editor-in-chief as follows: 1. A dictionary of physiology does not exist; 2. the classical treatises on physiology are too short and too old; 3. these classical treatises, however perfect they may be, can never supplant a dictionary.

These reasons are well supported by illustrations. Yet, however important and true these reasons may be, the authors felt morally justified in their undertaking by holding clearly in view the fact, that physiology, in order to be complete, should step out of its too narrow limits and invade those domains which to it were otherwise forbidden. Physics, bacteriology, medicine, chemistry, therapeutics, physiology ought to be treated in their main parts from a physiological point of view. Thus, e. g. the article cocaine will be found in medical and other dictionaries and hand-books. But it is not the physician's or surgeon's view of the subject, however exhaustive, nor the chemist's nor the pharmacognosist's primarily, which the physiologist desires. He wants in compact form the results of all investigations on the physiological effect of this drug upon the animal system and only such other information on the subject as will lead to a better understanding of his branch.

Again, bacteriology, though largely physiological, as a separate science includes much in which the physiological specialist is but little interested. Questions of identity, methods of cultivation, the special habits or size of bacteria are not in the programme of the physiologist. But he may not ignore the phenomena of infection, of incubation, of vaccination, of attenuation, of antisepsis.

Chemistry and physiology are so closely united that one might conceive the latter as a chapter of the former. It is therefore but natural that chemistry occupies a very important place in this dictionary.

A noteworthy feature of this dictionary is the importance given to history and bibliography, two extremely important subjects ofttimes largely, or even entirely neglected in text-books of physiology.

It is evident that this dictionary addresses itself above all to physiologists. No doubt all physiologists, whether of France or foreign countries, will more or less find themselves compelled to take cognizance of this work and to consult the same. The ideal of the authors, however, is still higher. It is expected that physicians, chemists, physiologists, naturalists and we may add intelligent pharmacists, who ofttimes have no easy access to larger physiological treatises and even less to original memoirs, will find this dictionary convenient and wellnigh indispensable. Physiology is a border science between medicine and pharmacy and it is just as important for the latter to be informed on physiological subjects as it is for the former. The truth of this statement will find exemplification in the reviews of the fascicles as they appear from time to time.

Of the seventy articles contained in the first fascicle several are veritable monographs. The last article, which is continued in the second fascicle, namely that on foodstuffs (Aliments) written by L. Lapicque and Charles Richet covers 88 pages. It is full of interesting information not only to the physiologist or scientist, but to the educated general reader as well. Other longer articles of more or less general interest are those on the alcohols (29 pages), on albuminoids (28 pages) and acclimatation (7 pages). There are a large number of articles of special interest to the pharmacist and chemist, notable among these an 18 page article on alkaloids with an interesting chapter on the history of the same. As many as 25 articles are on distinctively chemical subjects. A smaller number bear on vegetable and animal drugs. An article in which botany is very conspicuous is that on algae, covering 31 pages. Articles of distinctively physical bearing are those on accomodation (39 pages).

This may suffice to give the reader an idea of the general scope of the work. As will readily be seen, almost all collateral sciences are called into use and that which is of physiologic interest is emphasized. The result is that not only physiological specialists, but men of almost all sciences, who desire information on the physiological aspect of their science, will find this work of great and valuable assistance. Nothing more than a general outline can be given at present. In reviewing some of the other fascicles attention will be called to some of the more important details. The work is a credit to both authors and publisher.

E. K.

Pharmaceutischer Kalender, 1896. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Böttger und Dr. B. Fischer. In zwei Theilen. Fünfundzwanzigster Jahrgang. Verlag von Julius Springer, Berlin, 1896.

Although repeated attempts have been made in this country to publish pharmaceutical calendars, none has ever gained foothold. In Germany, calendars are yearly written for almost all trades and professions. The Pharmaceutische Kalender, 1896, lies before us in its 25th edition. It is the 36th edition of the Pharmaceutischer Kalender für Norddeutschland. It is printed in two parts.

Part I. contains information with regard to postal and telegraph rates, a railroad map of the German Empire, astronomical calendar, a pharmaceutical calendar for collecting medicinal plants etc., and a diary. Specific information is given under two headings: a. *Hilfsmittel für die Officin*; b. *Hilfsmittel für das Laboratorium.* Under the first heading are enumerated rules for compounding prescriptions, tables of maximum doses, abbreviations and symbols used on prescriptions, tables of solubility and saturation, poisons and their antidotes, incompatibilities, tables of weights and measures etc. Under the second heading are found tables of atomic weights of the elements, of molecular weights and compositions of the more commonly used chemical preparations, tables of specific gravity and percentage strength of acids and other aqueous solutions, also of alcohol etc.

Part II. constitutes a condensed pharmaceutical year book. The leading article is by Dr. Fischer on serum-therapy. This is followed by a codex of laws pertaining to pharmacy in the various states of the Empire, the names of the members of the various examining boards etc., a directory of the pharmacists of the German Empire, a catalogue of chemical, pharmaceutical and botanical literature that has appeared during the past year and a classified catalogue of firms dealing in pharmaceutical supplies.

Part I. is particulary useful for ready reference behind the prescription counter and in the laboratory. Part II. for similar use at the office desk.

E. K.

Erläuterungen zur qualitativen Analyse anorganischer Körper. Von Dr. Alexander Spraul. pp. XII, 173. C. W. Kreidel's Verlag, Wiesbaden. 1896.

As stated in the preface, this book is intended to serve as an explanatory supplement to the tables and short treatises used for the instruction of beginners in practical laboratory work, and at the same time to prepare the student by the necessary theoretical instruction for the more advantageous use of the extensive details of larger works.

In pursuance of this plan, the author has very successfully embodied in his work a description of chemical apparatus and the mode of its employment, illustrated by a number of wood cuts, followed by chapters on reagents, reactions of elements and compounds and on the methodical course of examination. The subject is treated in such a way, as to lead the student, not only to become acquainted with the facts, but also to understand the reasons for the successive steps taken to accomplish the work, and to draw his attention to the important characteristics of the phenomena to be observed. But while the book is mainly intended to serve as an intermediate between the first and more advanced instruction, it will also serve as sole text-book for those, whose business demands a lower limit of acquaintance with chemical analysis and who do not wish to go to the expense of a multiplicity of books. For it is far above the brief epitome of a science primer, while it avoids the bulky accumulation of special information found in the larger manuals.

Charles O. Curtman.

Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Redigirt von Dr. A. Hilger. Zehnter Jahrgang. Das Jahr 1895. Drittes Heft. pp. 321—483. Verlag von Julius Springer, Berlin. 1895.

In editing this quarterly Dr. Hilger is assisted by sixteen colleagues, who are connected with universities, agricultural experiment stations and sanitary bureaus in Germany and Austria. The object of this quarterly is to bring within easy reach of the analytical or sanitary chemist all such information pertaining to his domain as is constantly being published in a host of journals and a number of different languages. The names on the title page sufficiently vouchsafe for the accuracy and thoroughness with which this work of compilation is accomplished.

In as much as this work has heretofore been reviewed in the German language in the columns of the Rundschau, it may not be out of place to give a list of the chapters under which the numerous articles are abstracted: Meat (p. 321), Peptones and Meat Preparations (p. 327), Milk (p. 322), Cheese (p. 347), Butter (p. 349), Fats (p. 353), Spices (p. 358), Tea (p. 360), Coffee (p. 361), Cocoa and Chocolate (p. 363), Cane and Invert-sugar (p. 363), Glucose (p. 366), Other Sugars (p. 368), Fermentation (p. 372), Wines (p. 397), Beer (p. 414), Alcohol (p. 420), Vinegar (p. 431), Starch, Flour and Bread (p. 431), Water, Water-supply, Mineralwaters, Wastewaters (p. 437), Preserves and Preservatives (p. 449), Analytical Methods and Apparatus (p. 457), Laws, Ordinances and Court decisions (p. 465), Activity and Laboratories (p. 477), and Literature (p. 482).

The pages were added in the above list to indicate somewhat the amount of information given in each chapter. Not only do their quarterlies supply the busy chemist with new facts and methods, but the complete volumes are storehouses of valuable information. The abstracts are supplied with references, so that such chemists, as have good library facilities, can in many instances at least refer to the original articles for detailed information.

E. K.

Meyers Konversations-Lexikon, Band X.

Was man heute zu den unleugbaren Vorzügen eines Konversations-Lexikons auch rechnen mag, passt vor allem auf Meyers Konversations-Lexikon. Hinsichtlich der Vollständigkeit und Klarheit der Darstellung, der bewundernswerthen Durchführung des Bearbeitungsplanes, wie endlich des Reichthums und der Vortrefflichkeit des Bilderschmucks hat dieses Werk nicht seinesgleichen. Die Zahl und Tüchtigkeit der Mitarbeiter, die unermüdlichen Bestrebungen des Verlags, alles was die hochentwickelte Technik unsrer Zeit an Fortschritten zeitigt, für die Ausstattung des Werkes zu verwenden, verbürgen eben den vollsten Erfolg.

Eine objektive Prüfung des neu erschienenen zehnten Bandes bestätigt unsre Vorausschickung in allen Einzelheiten. Auf 1060 Seiten Text, mit Unterstützung von etwa 360 Textbildern und einer reichen Anzahl von Plänen, Karten und Bildertafeln, bringt auch dieser Band innerhalb der Stichworte: "Kaustik bis Langenau" eine Fülle zeitgemässen praktischen Wissens zur Darstellung. Seinen Inhalt kennzeichnen eine Anzahl wichtiger Beiträge von aktuellem Interesse, als "Kommunismus", "Krankenkassen" (mit umfassender Statistik), "Kredit", "Kolonien" (mit Karten), "Konsulatswesen"; ferner aus dem Gebiet der Rechtswissenschaft die umfassenden Arbeiten über Kriminalität (mit Karte), Krimnalstatistik, als Ergebnis einer auf tiefwissenschaftlicher Grundlage ruhenden Erkenntnis der Verbrechen und ihrer Ursache. Gründlich gehalten und mit lichtvoller Klarheit geschrieben sind die Artikel "Kirche", Kirchenpolitik". Der Geschichtswissenschaft ist ein ganz neuer Artikel über Koalitionskriege gewidmet. Die Arbeit hat neben ihrem wissenschaftlichen Gehalt noch insofern weitergehende Bedeutung, als sie in der vorliegenden Form ganz neu im "Meyer" erscheint und das verstreute historische Material zu einem Ganzen in übersichtlicher Darstellung vereinigt. Die geographisch-geschichtlichen Artikel "Kolumbien", "Kongo", "Kongostaat", "Kordilleren", "Korea" glänzen auch in dem neuen Band durch musterhafte Bearbeitung und weise Beschränkung des gewaltigen Stoffes auf den Kern des absolut Wissenswerthen. Als eine hervorragende lexikographische Leistung erweist sich der Artikel "Landkarten" mit instruktiver Beilage" Landkartendarstellung". Neben dieser Artikelreihe kommt die Landwirthschaft zu ihrem Recht, die sich sowohl unter ihrem Stichwort als auch unter den sich an das letztere anschliessenden Zusammensetzungen einer ausgezeichneten Darstellung durch eine Autorität ersten Ranges erfreut. Zahlreich vertreten sind auch die hygienischen und medizinischen Themata, die in den Beiträgen über Kind, Kinderernährung, Kinderheilstätten, Kleidung, Kost, Kriegssanitätswesen (mit 2 Tafeln), Krankenpflege, Krankheitsverbreitung in Deutschland (mit statistischer Karte), Fragen von einschneidendstem öffentlichen Interesse in vollster Wissenschaftlichkeit und doch gemeinverständlich erörtern. Die Bearbeitung der kunstgewerblichen und technischen Artikel ist im "Meyer" von jeher die denkbar beste gewesen. Es genügt daher, darauf hinzuweisen, dass auch die Arbeiten über Keramik (mit instruktiver farbiger Tafel), Kunstwissenschaft, Kupferstecherkunst, Kleinkraftmaschinen, Kochherde und Kochmaschinen (mit neuer reichhaltiger Tafel), Kühlapparate, Lampen (mit Tafel) etc., bis zu dem neuesten Stand fortgeführt sind.

Unbedingte Anerkennung verdient ohne Zweifel der Bilderschmuck des neuen "Meyer". Ist es im allgemeinen zeitgemäss, nicht bloss der Pädagogik, dem Wort durch das Bild, der abstrakten Darstellung durch Anschauungsmaterial zur Hilfe zu kommen, so hat Meyers Konversations-Lexikon nun noch in die bildliche Darstellung überall da, wo es thunlich erschien, das Prinzip der historischen Entwickelung hineingetragen und ist damit bestrebt, durch Versinnbildlichen des Werdeprozesses der dargestellten Dinge nach grossen Gesichtspunkten deren heutiges Sein erst ganz verstehen zu lehren und lange texliche Erörterungen überflüssig zu machen. Fast über jedes Bild des Meyerschen Konversations-Lexikons wäre etwas Neues und Gutes zu sagen, doch wollen wir uns begnügen, aus dem Bilderschatz des zehnten Bandes ausser den oben angeführten Illustrationen noch der Sondertafeln in Farbendruck "Kirschen", "unterseeische Korallenlandschaft", "Kostüme", "Landsknechte" und der kartographischen Beigaben "Karte vom Kielerhafen", "Kleinasien" (neu) als wirkliche Meisterwerke der heutigen Illustrationstechnik lobend zu gedenken. *F. H.*

Outlines of Materia Medica and Pharmacology. A text-book for students. By H. M. Bracken, M. D. Professor of Materia Medica, Therapeutics and Clinical Medicine, University of Minnesota. One volume, pp. 383. Publ, by P. Blakiston, Son & Co., Philadelphia. 1895. $2.75.

"This book is the outgrowth of work arranged in 1893 for medical students at the University of Minnesota, under the title of "Outlines of Materia Medica.'. It is intended that it shall serve the purpose of a text-book, for use in the study of materia medica; to facilitate note-taking in the lecture-room; and to aid in the laboratory study of drugs."

TABLE OF CONTENTS.

I. Introduction.
II. The Acids.
III. The Metals.
IV. The Non-metallic elements.
V. The Carbon Compounds.
VI. The Animal Kingdom.
VII. The Vegetable Kingdom.

Part I. or the Introduction contains miscellaneous information. To some of it chemists and pharmacists will, however, have to take exception. That mixtures "are properly speaking emulsions," (p. 20) certainly would require a stretching of the pharmacist's imagination. Glucosides are defined as substances, which decompose "into glucose and a second substance which is different in each instance," (p. 23.) How about glucosides yielding rhamnose (see Victor Meyer) or other sugars. Besides "the other substance" apparently may be the same after all (see p. 234.) "Volatile oils are obtained by distilling over *a certain volatile principle* (italics the writers) from vegetable products" (p. 21.) From peppermint oil about 15 different chemical substances have been isolated and yet the chemistry of this oil has not been exhausted.

The definition of capsules as being "small, elongated boxes with rounded ends" certainly might be improved. That they are used for administering drugs "in powder form" is no doubt true, but how about the administration of liquids in capsules? Many of the errors in spelling are no doubt to be attributed to the printer and indicate lax proof reading as eg. formulaes (p. 9), Na_2CH_5O (p. 59), sulphite for sulphide (p. 82), SbO_{23} (p. 112); but the spelling of the terms *aconitum radix* (p. 13) *belladonna folia*, (p. 14) rather indicates carelessness in copying if nothing more.

Parts II, III, IV and V. treat of chemical drugs. If a system of classification has been followed it certainly does not become apparent. Citric, tartaric and lactic acids are grouped with the inorganic acids, salicylic acid with the carbon compounds. Phosphorus is placed among the metals.

If the worlds supply of potassium and its salts depended upon plant ash (p. 44), farmers certainly would not use much potassium chloride for artificial fertilization. How zinc blende or calamine are converted into zinc oxide by "washing" (p. 78) certainly is a problem not yet solved by chemists. The statement that potassium permanganate "is obtained by combining potassa, manganese dioxide, potassium chlorate, diluted sulphuric acid and water" (p. 132) would certainly not pass a chemical student. The pharmaceutical student would immediately pronounce such a formula as a striking example of chemical incompatability.

In writing Part V. the author seems to have defied all principles of classification.

In as much as the book before us is so very largely made up of chemical matter, the writer, a chemist and not a pharmacologist, may be pardoned for having taken the liberty to review a work on materia medica. If the book as a whole were a great improvement on other works one might overlook any number of misprints, misstatements and incomplete statements. If the bibliography on p. 6, is fairly complete, the author appears to have obtained his information chiefly third hand. Not a single German work is mentioned. Indeed the author appears not to have known of some of the most valuable work done in systematic pharmacology in recent years.

The book work, which is neat and attractive, therefore appears in more favorable light than much of the contents at least when viewed from a chemist's point of view. The author should, however, be commended for conciseness, which is not a general characteristic of medical writers. *E. K.*

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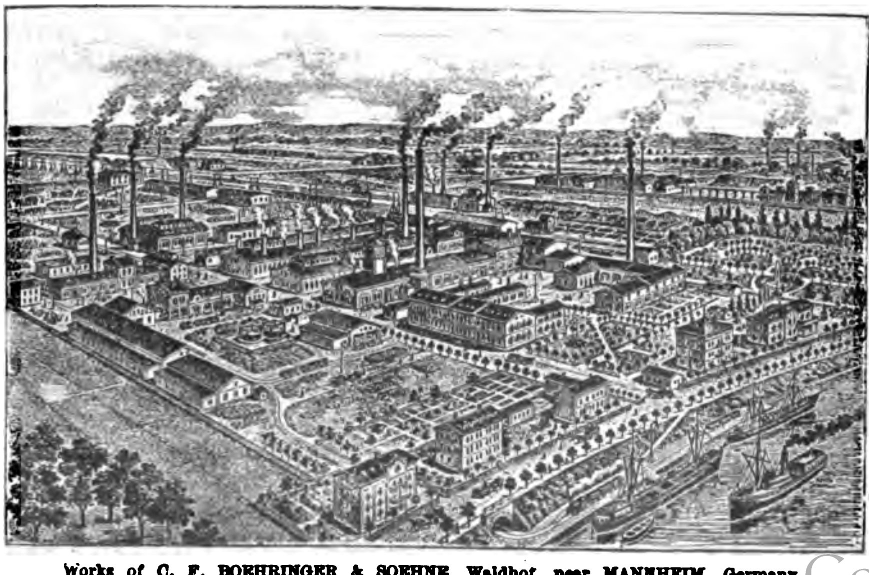

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 3. **MARCH, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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ANNOUNCEMENT FOR 1896.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JUL. SPRINGER, BERLIN.

Vol. 14, No. 1. **JANUARY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.60.

WITH the beginning of this year and of the 14th volume, the journal heretofore known as the **Pharmaceutische Rundschau** assumes the title of the **Pharmaceutical Review.** In consideration of some other changes incidental thereto we deem it expedient to offer the following remarks.

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The fact that the greater part of the **Review** has been printed in the German language has given rise numerous and constantly increasing requests to extend the usefulness and influence of the same by printing the English language. This request is to be granted with the beginning of this year, but not to the exte the total exclusion of the German. Such articles from German contributors as would suffer by translation hereafter, as in the past, be published in German, or in both English and German; but the main part of journal will be printed in the English language. This change in the character of the **Review** we believe prove in every respect advantageous, for most, if not all, its German readers in this country are as conver with the English as with their own language, and the same is almost equally true of its many subscribers readers in continental Europe.

The greatest change which the **Pharmaceutical Review** is about to experience consists in the partial ment of its distinguished founder and editor, Dr. HOFFMANN. The fact, however, that his name still ap foremost on the title page, clearly shows that his interest in the journal by no means ceases with his retir from the more active duties of its management. The names of the co-laborers not only demonstrate th **Review** has gained a wide circle of friends, but will also serve to remove any suspicion that a partial cha editorship may be attended by any loss of independence or general breadth of character. The national cha and the high standard which the **Review** has acquired under the able management of Dr. HOFFMANN, are maintained at all hazards; sectionalism and partisanship are to be equally avoided.

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Agents for Europe: JUL. SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 3. **MARCH, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

Educational Qualification of Chemists.

Only a few years ago German chemists received no official recognition from the German government. Any person who could manipulate a test-tube and a reagent had the right to call himself a chemist and offer his services to a more or less credulous public. The title chemist was not an official title, but could be applied by any person to himself as any dancing teacher or hypnotic trickster in this country has the legitimate right to call himself professor.

The better class of German chemists have for some years advocated a change to the effect that the title of chemist should imply a high-grade technical efficiency. That they have been very successful as far as the *Nahrungsmittelchemiker* or food-chemists are concerned has already been pointed out in the columns of this journal (Vol. 12, p. 275). By way of general preparation such chemists must have completed the gymnasium or a school offering an equivalent course. They must have spent six semesters at a university or polytechnicum and pass an examination before one of the examining boards appointed by the government. That these examinations are no farce may be judged from the character of the membership of such examining boards. They are mostly composed of experts, professors of universities and polytechnicums. By way of illustration the composition of one of these may here be given.

The commission to conduct the *Vorprüfung* or primary examination at Bonn consists of the following members:

Chairman: Dr. Gandtner, curator of the University.

Examiners: Dr. Kekulé, professor of chemistry; Dr. Klinger, assistant professor of chemistry; Dr. Strassburger, professor of botany; Dr. Kayser, professor of physics.

The commission to conduct the *Hauptprüfung* or final technical examination at the same place consists of the following members:

Chairman: Dr. Unger, professor of medicine.

Examiners: Dr. Stutzer, director of the agricultural experiment station; Dr. Auschütz, assistant professor of chemistry; Dr. Schimper, assistant professor of botany.

The technical chemists now desire similar recognition. Their title has been misused even more than that of the food-chemists. Since the latter have received official recognition, the former feel all the more that, as far as public and official recognition is concerned, they now more than ever have been relegated to a back seat. The German Society for Applied Chemistry therefore elected a commission last year at Frankfurt, which was to propose a plan for the examination of chemists in general. This commission, consisting of Dr. C. Duisberg of Elberfeld, Prof. F. Fischer of Göttingen, Dr. Hintz of Wiesbaden, Prof. Ruedorff of Berlin, Dr. Scheuer of Hanover and Prof. Wislicenus of Leipzig, met in November last and prepared the following schedule of requirements for the examination of technical chemists.

Upon application for examination the candidate must present the following:

1. The graduation certificate from a German gymnasium, *Real gymnasium*, or an *Ober-Realschule* with nine classes or an industrial school offering an equivalent course.

2. The certificate of two years' attendance at a university or technical high-school* when making application for the *Vorprüfung* or primary examination; and of four years' attendance when making application for the final examination, or *Hauptprüfung*.

I. *Vorprüfung*.

Toward the close of the fourth semester the primary examination can take place. A qualitative and a quantitative examination must be carried out in the laboratory of the university or technical high-school. This is followed by an oral examination in inorganic chemistry, analytical chemistry, physics, mineralogy and crystallography; and in either botany and zoology or the elements of machine construction and the construction of buildings.

II. *Hauptprüfung*.

After four more semesters of study, the applicant must present certificates to the effect that he has had six semesters of practical instruction in chemical laboratories at a university or technical high-school. The examination comprises:

1. Dissertation on experimental chemical research performed by the candidate. This must be signed by the academic teacher, certifying that it is the work of the candidate.

2. Oral examination in general inorganic chemistry, organic chemistry, physical chemistry, including electro-chemistry, technical chemistry, principles of political economy and of laws pertaining to factories, accidents, and patents, as far as they concern chemical industry.

The proposition was sent to the members of the society, and 339 are reported thus far as having replied to the request for an expression of opinion. Of this number 177 reported favorably without any change, 90 proposed slight changes, 69 greater changes, and only 3 considered such an examination superfluous.

It is but natural that German pharmacists who see the salvation of their calling in similar educational requirements are watching the success of their chemical brethren with an envious eye. In fact, of the 145 persons, who in 1895 have received the certificate as *Nahrungsmittelchemiker*, 63 are such apothecaries, who surpassed the legal requirements for the title "Apotheker" sufficiently to enable them to take the examination as food chemists. It is now being argued that if it is necessary for the public to demand a higher educational qualification of the food chemist, it certainly becomes apparent that the pharmacist should be equally well prepared for his calling. Whereas, formerly pharmacists thought that in the appointment of apothecaries as food-chemists, they might find new channels of legitimate employment, and thus give new lustre to their calling, voices are now being heard more and more which claim that each of these callings demand its man. In fact, some have expressed the fear that the title of *Nahrungsmittelchemiker* being more honored, on account of the higher educational qualification demanded, than that of *Apotheker*, many of the best educated pharmacists will avail themselves of their better education and leave their former profession.

Whereas, those pharmacists who for years have labored apparently in vain to bring about similar educational reforms in their own ranks, may rightly envy their successful brethren, the success of the food chemists and the fair prospects of the technical chemist will no doubt incite them to greater activity still, and will possibly open the eyes of the government, and of those in their own ranks who have persistently opposed such changes. That which is of particular interest to American pharmacists, is the conservatism of their German pharmaceutical brethren and the freedom from traditional requirements which permits the chemists of the same country to act in harmony with present-day educational ideas.

The apprenticeship finds no place in the educational course of the food-chemist or of the technical chemist. Graduation from a gymnasium or its equivalent, i. e., that general preparation which is the *sine qua non* of all learned professions in Germany, is demanded as a foundation on which to build the general scientific and later the more technical training.

At one of the meetings of the Society for Applied Chemistry, Dr. Duisberg, scientific director of the *Farbenfabrik* at Elberfeld, spoke emphatically against the taking of apprentices. He even did not want the prospective chemist to specialize with regard to any particular branch of chemistry at the university or at the polytechnicum. Of the ninety chemists under his charge at Elberfeld, those were not the best who had studied the chemistry of dye stuffs at the technical schools, but those who had laid a broad foundation. He further states that it is remarkable how readily those who have laid a broad scientific foundation will work themselves into any special department into which they may be placed.

A few years ago Prof. Ostwald, (Rundschau 13, p. 134), in a lecture delivered before the Association of German Electricians, explained why it was that English chemical industry was going backward, comparatively speaking, and why the same in Germany apparently was monopolizing the markets of the world. The ninety chemists at the *Farbenfabrik* in Elberfeld and hundreds of others in the chemical factories of Germany with their thorough general preparation and their university training are the secret of the marvelous success of this branch of industry.

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* In Germany the term *Hochschule*, or high-school, is not applied to secondary schools, as is the case in this country, but to the universities and polytechnicums.

The English are recognizing this fact more and more. Not only are English scientists pleading for a change, but even the larger daily papers are demanding it from the government. A higher and broader education for technical men is not a fancy of university professors, but the demand of the hour. The lack of this is costing England millions every year, and now that England has recognized her shortcoming in this direction these millions will, no doubt, speak louder and more eloquently than the humble visionist in the university laboratory.

Will pharmacists in general, will the American pharmacist sooner or later learn the same lesson? The history of pharmacy is no doubt a very interesting chapter of the history of civilization and no true pharmacist would part with it, even if it were the price to be paid for his professional salvation. But the law of evolution demands no such price. We may continue to revel in the past, yet we need not become the slaves of tradition any more than of the almighty dollar. That which has so largely made the *Farbenfabriken* and other chemical factories in Germany, and the lack of which has assisted in unmaking chemical industry in England, will be the making of professional pharmacy in America. Druggists all over the country are complaining bitterly because they are taxed so severely by these *Farbenfabriken* of Germany. Our government even protects these very *Raubritter* beyond the sea by copyrighting the names of their pharmaceutical chemicals. American pharmaceutical manufacturers have demonstrated that they can outstrip any people in the manufacture of galenical preparations. All of the large pharmaceutical manufacturing establishments, in recent years at least, are employing scientific chemists. To our disgrace it must be said that many of them are not Americans but Germans. The Ph. D. of Germany is as much sought by the American chemical and pharmaceutical manufacturers as by the English. These firms are not paying large salaries for a mere ornament. Americans can and in the course of time no doubt will manufacture their own chemicals as well as their own galenicals. But America, can no more compete with Germany than could England, unless she employs the same methods. American manufacturers have already recognized this fact. The practicing pharmacist cannot, like the manufacturer, employ scientific help of a high order, but he can achieve the same or even a better result by the higher education of his own ranks. Herein lies his salvation.

E. K.

ORIGINAL CONTRIBUTIONS.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.

Mirabilis Jalapa L. In den Tropen bis zur Aequatorialzone. Bekannt als *Jalapa do mato* — wilde Jalappe; *Jalapa comprida* — lange Jalappe; *Purga de nabico* — Rübenpurgans.

Stengel aufrecht, gabelästig, bis einen Meter hoch; Blätter glatt, gegenständig, oval-herzförmig, zugespitzt; Blüthen purpurfarben, trichterig; Frucht oval, liegt im Kelche, von der Grösse einer grossen Erbse.

Die fleischige, langspindelförmige Wurzel ist aussen braun, im Durchschnitt gelb. Im frischen Zustande ist sie von unangenehmem Geruch und ekelerregendem Geschmack. Dieselbe wird in Scheiben geschnitten und auf Bindfaden gereiht an der Sonne getrocknet.

Mirabilis Jalapa L. In the tropical regions as far as the equator. Known as *Jalapa do mato* — wild jalap; *Jalapa comprida* — long jalap; *Purga de nabico* — "Ruebenpurgans."

Stem erect, forkedly-branched, reaching a meter in height; leaves smooth, opposite, oval-cordate, acuminate; flowers purple, funnel-form; fruit oval, enclosed in the calyx, in size equal to a large pea.

The fleshy, long-fusiform root is brown externally, in section yellow. When fresh it possesses an unpleasant odor and a nauseating taste. It is cut into discs, which are strung on twine and dried in the sun.

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*Continued from vol. 13, p. 237. Translated for the Review by Dr. *R. H. True*, instructor in pharmacognosy at the University of Wisconsin.

Comparatively little is known about the medicinal plants of Brazil, so that any and all information concerning the same is of interest to pharmaceutical students everywhere. German journals and the compiler of the German pharmaceutical *Jahresbericht* have, therefore, made liberal use of the articles from the pen of Dr. Peckolt that have appeared in the earlier volumes of the Review. For this reason it was thought best to give the original German side by side with the English translation. If the English version were to be retranslated into German the manuscript would certainly suffer more or less from a double translation. [Editor Review.]

Das Pulver, in der Dosis von 2 bis 4 Grammen als Abführmittel gegeben, verursacht stets Leibschmerzen. Bei Sumpffiebern wird vom Volke erst dies Abführmittel genommen, dann Chinin. Das Stärkemehl wird vom Volke als Laxans für Kinder benutzt.

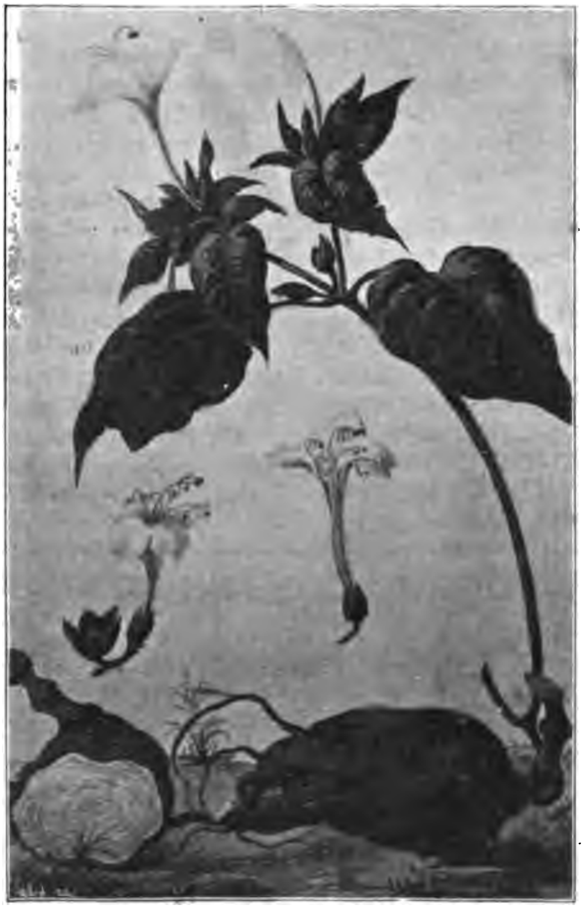
Nach Manso soll das hier im Handel befindliche *Resina de batatas*, welches als Ersatz von Jalapenharz dient, aus dieser Wurzel bereitet werden. Dasselbe wird von Pernambuco und Bahia aus in den Handel gebracht. Durch den Reisenden des hiesigen Museums, Herrn Schreiner, erhielt ich ein Herbariumexemplar der Pflanze aus dessen Wurzel das Harz bereitet wird. Dieses jedoch war nicht *Mirabilis Jalapa L.*, sondern *Operculina convolvulus*, der Familie *Convolvulaceæ* zugehörend.

Mirabilis dichotoma L. Heimisch in Mexico und Guiana, wahrscheinlich auch in den hiesigen Nord-Staaten. Hat sich in allen Staaten verbreitet und verwildert. In allen Gärten, an den Wegen der Landstrassen, auf den Höhen des Orgelgebirges zeigt die ursprünglich rothe Blüthe alle Farbennuancen: roth, weiss, gelb; roth und weiss gefleckt. Bei Sonnenschein sind die Blüthen geschlossen. Kurz vor Sonnenuntergang öffnen sich dieselben und verbreiten einen Wohlgeruch, welcher dem einer Mischung von Jasmin und Reseda ähnlich ist. Als Volksnamen sind zu erwähnen: *Bellas noites* — schöne Nächte; *Bon noite* — gute Nacht; *Bonina* — Tausendschön; *Maravilha* — Wunderblume.

Der aufrechte, gabelästige, knotige Stengel ist dicker und niedriger als bei der Vorhergehenden. Die Blätter sind kleiner, oval, etwas zugespitzt, an der Basis abgestumpft. Die Blüthen sind fast sitzend, trichterig. Der runde Samenkern hat die Grösse einer kleinen Büchsenkugel. Die Samenschale ist schwarz und runzelig. Unter der Samenschale befindet sich eine harte hellbräunliche Pelicula, welche den Kern umgiebt. Dieser ist mit schneeweissem fast trockenem Stärkemehl gefüllt. Das Embryo befindet sich an der einen Seite, welche durch eine Rinne markirt ist.

Ein frischer Same wog im Mittel 0.150 Gramm und enthielt 0.038 Gramm Stärkemehl. In 100 Gramm frischen, entschälten Samen sind enthalten: Stärkemehl 18.733 p. c., weissgelbliches Fett von Butterconsistenz 0.4 p. c., bräunliche Harzsäure 0.333 p. c.

Die Mädchen bereiten das Stärkemehl, vermischen dasselbe mit Citronensaft zu einer weichen Masse und bestreichen damit die Sommersprossen.



Mirabilis dichotoma L.

The powder, given as a purgative in a dose of from 2 to 4 grams, always causes abdominal pains. In swamp-fever, among the people, this purgative is first taken, then quinine. The starch is used by the people as a laxative for children.

According to Manso the *Resina de batatas*, here found on the market as a substitute for jalap resin, is prepared from this root and comes from Pernambuco and Bahia. Through the traveling agent of the local museum, Mr. Schreiner, I obtained an herbarium specimen of the plant from the root of which the resin is prepared. It is not *Mirabilis Jalapa L.*, but *Operculina convolvulus* of the family *Convolvulaceæ*.

Mirabilis dichotoma L. Native in Mexico and Guiana, probably also in the northern Brazilian states, this plant has become wild and has spread throughout the country. One finds it in all gardens, at the roadsides, and on the heights of the Organ Mts. The flowers, which were originally red, show all shades of color: red, white and yellow; or spotted red and white. In sunshine the flowers remain closed. Shortly before sunset they open, giving off a pleasant fragrance which resembles that of a mixture of jasmine and mignonette. It is known by the following common names: *Bellas noites* — beautiful night; *Bon noite* — good night; *Bonina* — "Tausendschoen"; *Maravilha* — wonderflower.

The upright, forked, jointed stem is thicker and lower than in the preceding. The leaves are smaller, ovate, somewhat acuminate, and blunt at the base. The flowers are almost sessile, funnelform. The round seed is of the size of a small bullet. The outer seed-covering is black and wrinkled. Beneath this is found a hard, light-brown pellicle, which surrounds the kernel. This is full of almost dry, snow-white starch. The side where the embryo is found is marked by a groove.

A fresh seed weighed on the average 0.150 gram and contained 0.038 gram starch. From 100 grams of fresh seeds, deprived of their seed coats, there was obtained: 18.733 p. c. starch, 0.4 p. c. of a yellowish fat of butyraceous consistence, and 0.333 p. c. of a brownish resin acid.

The girls prepare the starch, mix it with lemon juice to form a soft mass, which they use to rub on freckles.

Die Wurzelknollen sind schwarz, Rettig ähnlich nur länger, mit kleinen Mohrrübenförmigen Ausläufern. Im Durchschnitt sind dieselben weiss, sich an der Luft röthend.

In 1000 Gramm frischen Knollen wurden gefunden:

Wasser	833.000
Fettsäure	1.223
Weichharz	0.577
α–Harzsäure	0.110
β–Harzsäure	3.555
Eiweissstoffe	2.300
Stärkemehl	30.000
Zuckerhaltiger Extractivstoff	15.000
Extractum aquosum	10.000
Asche	17.000

Die krystallinische Fettsäure ist strohfarben, geruchlos und von schwach ranzigem Geschmack. Mit Schwefelsäure färbt sich dieselbe rothbraun. In kleinen Dosen wirkt sie nicht abführend.

Das Weichharz ist fahlgelb, von Terpentinconsistenz, ist geruchlos und besitzt einen ekelerregenden Nachgeschmack. Es verbrennt mit lebhafter Flamme ohne Rückstand. Mit Schwefelsäure färbt es sich purpurroth, dann blutroth, während die Säure selbst farblos bleibt. Es löst sich nur in Aether, Chloroform, Amylalcohol und absoluten Alkohol. In Dosen bis zu 0.4 Gramm verabreicht bewirkte es keinen Stuhlgang.

Die *α*–Harzsäure ist hellgelb, stark klebend, geruchlos und von unangenehmem, schwach bitterem Nachgeschmack. Dieselbe verbrennt mit lebhafter Flamme ohne Rückstand. In Schwefelsäure löst sie sich mit rothbrauner Farbe. Dieselbe ist löslich in Petroläther, Benzol, Chloroform, Aether, Alkohol und Ammoniak.

Die *β*–Harzsäure is fest, dunkelbraun, geruchlos und von unangenehmem Nachgeschmack. Dieselbe verbrennt mit lebhafter Flamme und eigenthümlichem nicht unangenehmem Geruch ohne Rückstand. Mit Schwefelsäure färbt sie sich rothbraun. Sie löst sich in Chloroform, Eisessig, Alkohol und Alkalien.

Eine Dosis von 0.8 Gramm bewirkte erst nach drei Stunden mehrfaches Purgiren mit Leibschmerzen. Die Aerzte verordnen das spirituose Extract in der Dosis von 1 Gramm, das Wurzelpulver in Dosen von 3 bis 6 Grammen bei Wassersucht, Leucorrhea und herpetischen Ausschlägen. Ein Decoct von 8 Gramm Wurzel zu 360 Gramm Colatur, während des Tages in drei Portionen getrunken, wurde neuerdings als heilkräftig bei Diabetes gerühmt. Nach meinen Beobachtungen wurde am zweiten Tage schon bedeutend weniger urinirt. Am vierten Tage war kein Zucker mehr nachweissbar. Nach dem achten Tage konnte oder wollte der Kranke die unangenehmschmeckende Arznei nicht mehr nehmen. Zwei Tage darauf wurde wieder Zucker im Harn gefunden. Es wäre wünschenswerth, dass von Aerzten ausführliche therapeutische Untersuchungen unternommen würden.

Die frischen, gestossenen Blätter dienen als Umschlag auf Furunkel zur schnellen Eiterung.

Bougainvillea spectabilis Willd. In den tropischen Staaten bis Bahia. Bekannt als: *Roseira do mato*—Waldrose; *Paó de roseira*—Rosenbaum; *Roseta*—Schmuckbaum. Findet die üppigste Entwickelung an den nordwestlichen Abhängen des Orgelgebirges, in den Distrikten der Kalkformation, wo dieser baumartige Strauch in der Blüthezeit einen prachtvollen Anblick darbietet.

The tubers are black, resembling the radish only longer, with small carrot-shaped stolons. In section they are white, becoming red when exposed to the air.

In 1000 grams of the fresh tubers was found:

Water	833.000
Fatty acid	1.223
Soft resin	0.577
α–Resin acid	0.110
β–Resin acid	3.555
Proteids,	2.300
Starch	30.000
Sugar-containing extract	15.000
Aqueous extract	10.000
Ash	17.000

The crystalline fatty acid is straw-colored, odorless and of a slightly rank taste. With sulphuric acid it becomes reddish-brown. In small doses it does not act as a purgative.

The soft resin is pale yellow, of the consistence of turpentine, odorless and possesses a nauseating aftertaste. It burns with a bright flame leaving no residue. Sulphuric acid colors it purple-red, then blood-red, the acid itself remaining colorless. It is soluble only in ether, chloroform, amyl alcohol and absolute alcohol. Administered in doses up to 0.4 gram it produced no passage of the bowels.

The *α*–resin acid is light yellow, very sticky, odorless and has an unpleasant, slightly bitter aftertaste. It burns with a bright flame without residue. It dissolves in sulphuric acid with a reddish-brown color. It is soluble in petroleum-ether, benzene, chloroform, ether, alcohol and ammonia.

The *β*–resin acid is solid, dark-brown, odorless and possesses an unpleasant aftertaste. It burns with a bright flame and a peculiar, not unpleasant odor, leaving no residue. Sulphuric acid colors it reddish-brown. It is soluble in chloroform, glacial acetic acid, alcohol and in alkalies.

A dose of 0.8 gram caused after three hours repeated purging with abdominal pains. Physicians prescribe the alcoholic extract in doses of 1 gram, the powdered root in doses of from 3 to 6 grams for dropsy, leucorrhœa and herpetic eruptions. Lately it has been favorably mentioned as a remedy in diabetes. A decoction of 8 grams of the root to 360 grams colature is taken during the day in three portions. According to my own observations the amount of urine passed was considerably diminished on the second day. On the fourth day a reaction for sugar was no longer obtainable. After the eighth day the patient could not or would not take more of the unpleasant-tasting medicine. Two days later sugar was again found in the urine. It would be very desirable if extended therapeutic experiments were made by physicians.

The fresh, bruised leaves are used as an application to carbuncles for rapid suppuration.

Bougainvillea spectabilis Willd. In the tropical states as far as Bahia. It is known as: *Roseira do mato* — wood rose; *Paó de roseira* — rose tree; *Roseta* — ornament tree. It shows the most luxuriant growth on the northwestern slopes of the Organ Mountains, in the district of the limestone formations, where this tree-like shrub at the time of blooming offers a most beautiful sight.

Dieser sowohl als der Folgende werden durch Stecklinge vermehrt, welche hier im Staate Rio nur gedeihen wenn dieselben im Monat August gepflanzt werden. Ich pflanzte in meinem Garten einen Steckling von 32 Centim. Höhe in mit Kalk gedüngtem Boden. Nach drei Jahren hatte derselbe schon vier Meter Höhe und blüthe üppig. Auf den Höhen des Orgelgebirges in Neufreiburg, Petropolis etc. gedeiht derselbe zu einem dickstammigen Baume. In dem Tieflande bildet derselbe stets einen baumartigen Strauch mit abstehenden Aesten. In den Axeln der Zweige befinden sich scharfe, oft 5 Cm. lange Stacheln. Die abwechselnd stehenden kurzgestielten Blätter sind oval, stumpf oder kurz zugespitzt. Der Blüthenstand ist endständig, mit grosser, ästiger Blüthenrispe. Die Blüthen sind mit drei grossen prachtvollgefärbten Hochblättern versehen, welche je nach Standort, auf Kalkboden roseroth, auf Granitboden hell scharlachroth gefärbt sind.

Der medicinische Gebrauch dieser Pflanze ist sehr beschränkt. Dieselbe wird vorzugsweise als Zierbaum in den Gärten angepflanzt. Das Decoct der Wurzelrinde findet Verwendung als harntreibendes und gelindwirkendes Abführmittel; das Decoct der Blätter als Einspritzung bei Leucorrhea; die an Potasche reiche Asche zur Reinigung des Zuckers.

Die beiden folgenden Species werden nicht arzneilich benutzt, doch ebensohäufig zum Schmuck der Gärten kultivirt.

Bougainvillea glabra Choisy bewohnt denselben Bezirk, geht aber im Staate S. Paulo noch jenseits der Tropenzone. Derselbe wird ebenfalls oft baumartig, besitzt roserothe Hochblätter und ist unter dem Volksnamen *Tapirica* bekannt.

Bougainvillea pomacea Choisy. Auf den Ebenen der Tropenzone bis Bahia. Ist stets strauchartig. Blüthenstand in strausartigen Rispen mit ziegelrothen Hochblättern. Volksbenennung: *Tres Marias.*

This, as well as the following plant, are multiplied by cuttings, which here in the state of Rio thrive only when planted in the month of August. I planted a cutting 32 cm. long in soil fertilized with lime. After three years it had already reached a height of four meters and blossomed luxuriantly. On the heights of the Organ Mountains, at Neufreiburg, Petropolis etc. it becomes a thick-stemmed tree. In the lowlands it always forms a tree-like shrub with spreading branches. In the axils of the twigs stand sharp thorns, often 5 cm. long. The alternate, short-petioled leaves are oval, blunt or short acuminate. The inflorescence is a large, terminal, branching panicle. The flowers are provided with three large, showily-colored floral leaves, which according to locality have characteristic colors; in calcareous soil they are bright rose-red, in granitic soils light scarlet-red.

The medicinal use of this plant is very limited. It is planted in gardens mainly as an ornament. The decoction of the root bark is used as a diuretic and mild purgative; the decoction of the leaves as an injection in leucorrhœa. The ash, which is rich in potash, is used in purifying sugar.

The two following species are not used medicinally, but are cultivated as frequently for ornamenting gardens.

Bougainvillea glabra Choisy grows in the regions indicated for the preceding species, but in the state S. Paulo is also found on the other side of the equator. It is likewise often tree-like, has rose-red floral leaves and is commonly known as *Tapirica.*

Bougainvillea pomacea Choisy. Upon the plains of the tropical zone as far as Bahia. It is always shrub-like. The inflorescence is a thyrsoid panicle with brick-red flowers. Popular name: *Tres Marias.*

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Asafoetida.[1]

By Prof. *J. U. Lloyd.*

Brief Description of the Drug.

Leading authorities inform us that asafoetida is a gum resin exuding from the roots of the genus *Ferula* of the natural order *Umbelliferae.* The smell so characteristic of the resin is mainly to be found in the following species:—

I. *Ferula Scorodosma* Bentley & Trimen, (Synonyms, *Ferula Asafoetida* Linn., Boissier; *Ferula foetida* Regel.)

II. *Peucedanum Narthex* Baillon.

The drug comes to Europe from southern Persia and Afghanistan, usually via Bombay, and is obtained by making incisions into the roots of the aforenamed plants at a certain time of the year, and collecting the exudation. Inert substances are invariably incorporated with it, in order to give the milky juice a proper consistence and render it convenient for shipment.

The best kind of asafoetida thus obtained is *Asafoetida in granis,* consisting of roundish tears of varying size, sometimes as large as 3 cm., or of flattened pieces, often sticking together. These tears are white at first, but when exposed to light and air, assume a delicate red hue which slowly changes into purple-red and brown. The inner portion remains wax-like and white. With water they form an emulsion, which alkalies turn to an intense yellow.

The common kind, *Asafoetida in massis,* consists of a granular conglomerate in which are imbedded single tears of the better kind; and admixed therewith are inert substances, like clay, calcium carbonate, gypsum, particles of roots and stems.

While it is true, that for the reason mentioned before, the addition of such extraneous matter is justifiable if within moderate limits, it is also well known that in the asafoetida trade these limits are far from being observed, and that for years the addition of foreign matter to asafoetida has been sometimes in enormous proportions. However, recent workers on the asafoetida subject,[2] seem to entertain a more hopeful view of the situation with regard to asafoetida imported for this country; whether this hope is sustained by the results given in this paper, remains a matter of individual opinion.

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[1] Credit is hereby given to Dr. Sigmond Waldbott for detail work and valuable assistance.

[2] See Albert Plaut, Pharmaceutical Era, 1894, p. 517, "Adulteration of drugs in the United States."

Recent Literature on the Examination of Asafoetida.

The principal lines of examination which have been followed thus far in order to establish a standard for purity of asafoetida, and which are also adopted in the present paper, are limited mainly to the determination of the amount of alcohol-soluble matter and of ash left upon incineration of the drug. In recent years, additional methods have been introduced which will be touched upon at the end of this paper.

Both the Pharmacopœia of the United States and the German Pharmacopœia make a certain allowance for the amount of inert matter contained in asafoetida: "At least 60% of it should dissolve in alcohol," U. S. P., 1890. "More than 50% of the drug should be soluble in alcohol," and "100 parts of asafoetida should leave not more than 6 parts of Ash." Germ. Ph., 3rd edition, 1890.

It follows that the German Pharmacopœia makes less strict requirements with regard to soluble matter, but gives some requirements for the amount of ash which the U. S. P. has (wisely?) omitted.

From the literature on hand it seems as though the requirement for alcohol-soluble matter of the U. S. P. is rarely met with, and not at all that of the German Pharmacopœia with regard to the amount of ash. In consequence, the German firm of Gehe & Co. refused to supply the drug.[3]

Flückiger[4] mentions that the juice obtained early in the season seems to contain less resin than that obtained later. One specimen of a lot from Kandahar, very scarce and costly, which he received from a reliable source, yielded only 10.8% resin, but 47.9% gum, while an ordinary selected quality, of later-gathered asafoetida yielded him 71.4% resin. As to ash, he states that one specimen of the purest grains left upon combustion only 3/4% ash, while another good specimen, selected in Bombay for the European market, yielded 8.71% ash. In the following cases we are confronted with asafoetida of very different characters. **Fristedt** and **Th. Mörner**[5] examined a curious specimen of asafoetida consisting of 86% of alabaster and only 14% of asafoetida. **E. Dieterich**[6] experimented on three specimens of crude asafoetida, obtaining the following values:—

	Percent. soluble in alcohol.	Percent. ash.
I.	15.43,	66.0.
II.	18.70,	54.0.
III.	53.60,	15.6.

W. A. Puckner[7] determined the amount of alcohol-soluble matter and of ash in five samples of asafoetida as it was then found in the American wholesale trade. His results as far as they are of interest for our purpose are as follows:—

	Soluble in alcohol.	Total ash.
I, best kind in mass...	59.49%,	19.45%,
II, best kind in mass...	27.39%,	56.03%,($CaSO_4$, $CaCO_3$).
III, best kind powdered, N. Y..........	44.48%,	38.59%, ($CaSO_4$).
IV, best kind powdered, Chicago....	33.47%,	47.86%,
V, "purified goods," powdered...........	31.35%,	55.38%.

Space does not permit the regarding of earlier researches instituted by Schaer, Maisch, Price, and others.

Present Condition of the Drug.

Recently in attempting to procure asafoetida that would meet the requirements of the U. S. P., representative samples were obtained from different New York importers of unimpeachable integrity. Be it said to their credit, none of the dealers were willing to guarantee it to conform to the U. S. P., indeed the general impression was that commercial asafoetida would not stand the U. S. P. alcohol test. The result illustrates the difficulty these importers labor under when it is seen that of samples from six different parcels, selected for this examination, only one answered the purpose.

In this line of experiments the amount of alcohol-soluble matter was determined by boiling out a weighed quantity of asafoetida repeatedly with an excess of alcohol, drying and weighing the residue. The ash was determined in most cases by incinerating the original sample; in some cases marked by an asterisk (*), the ash was also determined by incinerating the residue left by the alcohol.

The following samples were operated upon:—

Sample A.—Soft mass, conglomerate of small grains; very few large tears present, color first reddish, later gray; visible impurities—Cloth, bristles, wood.

Sample B.—Soft mass. Rather uniform appearance, few large tears imbedded.

Sample C.—Some large tears present of about half the total weight (12 in 25). To all appearance good specimen, remarkably dry.

Sample D.—A mixture of 1 part of pure tears and about 4½ parts of gray mass with some tears imbedded. Dry specimen. Brown color.

Sample E.—In appearance resembles Sample D, the tears are present in the proportion of about 1 in 5.

Sample F.—Somewhat glossy appearance. Small grains, uniform-looking specimen. (Origin, Persia).

Sample G.—Same in character as Sample F.

The results of the examination are given in the following table. In most samples several pieces were examined as shown by the figures affixed to the letters in the first column. The total averages in columns II and IV are calculated on the basis laid down in the preceding description of the specimens.

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[3] Gehe, Handelsbericht, April, 1891.

[4] Pharmacognosie des Pflanzenreiches, 3rd ed. Berlin, 1891.

[5] Pharm. Rundschau, 1889, p. 205, also Jahresb. d. Pharm. 1889, p. 138.

[6] Jahresb. der Pharm., 1891, Vol. 26, p. 11.

[7] Proc. Am. Pharm. Assn., 1890, p. 180, also Western Druggist, 1890, p. 361, and Druggists' Circular, 1890, p. 225. "What amount of sand is present in commercial asafoetida?"

Table I.

Designation of specimens.		Per cent soluble in alcohol.			Per cent insoluble in alcohol.	Per cent ash.	Per cent ash Total average	Prominent inorganic constituents.
			Average.	Total average.				
A.	I. a.	37.1		35.6	62.9	44.33 *	49.16	Mostly crystallized gypsum.
	b.	34.2			65.8	53.98		
B.	I. a.	42.01		37.7	57.89	36.33 *	43.1	Gypsum.
	b.	36.6			63.4	43.84 *		
	c.	34.7			65.3	49.14		
C.	I. a.	71.85	66.77	55.06	28.15	1.78 *	20.5	Gypsum, carbonates.
	b.	61.7			38.30	2.47		
	II. a.	45.97	46.26		54.03	35.15 *		
	b.	52.17			47.83	31.71		
	c.	41.02			58.98	39.97		
	d.	37.9			62.1			
D.	I.	76.3		40.74	23.7	2.55	38.1	Carbonates, gypsum, clay.
	II. a.	36.4	32.84		63.6	42.17 *		
	b.	29.29			70.71	49.95 *		
E.	I.	76.01		44.39	23.99	1.79	34.7	Gypsum, occasionally lumps of stone.
	II.	36.49			63.51	42.83		
						42.99		
F.	I. a.	65.2		65.9	34.8	16.3	16.3	
	b.	66.6			33.4			
G.	I. a.	66.15		66.45	33.85	16.19 *	16.19	$CaCO_3$, gypsum.
	b.	66.75			33.25			

Discussion of the Table.

With regard to alcohol-soluble matter (column 2), the table shows that of all the specimens examined, only one conformed to the requirements of the U. S. P., viz., sample F, and its check sample G, which was taken from the package ordered on the strength of the result in sample F, showing that the package ran true to sample.

While in samples C, D, and F, there are single tears present which yield to alcohol more than the Pharmacopœia requires (as high as 76% in D, and E), they occur with inferior grades which reduce the average below 60%. However, sample C comes rather near this percentage.

With regard to the alcoholic residues (column 3), they consist both of organic and inorganic matter. The organic substance is a peculiar kind of gum, which on the authority of Flückiger[8] is not very soluble in water. Its presence can easily be demonstrated by the reducing action on Fehling's solution, which may be developed by warming a decanted (turbid) aqueous infusion of the alcoholic residue with a few drops of hydrochloric acid. Especially such samples as C, I, and G, responded to this test very strikingly.

The inorganic substance of the alcoholic residue, as will be seen from the last column (5) has gypsum as a common constituent, this mineral being very abundant in the vicinity of Kandahar where asafoetida is gathered.[9]

Two of the specimens, D and E, also contain silica to an appreciable extent.

Column 4, comprising the ash results, gives an idea as to the quantities of inorganic admixture. The pure tears of C_I, D_I, and E_I, leave very little ash, only 1.78, 2.47, 2.55 and 1.79% respectively. The specimen F has 16.3% and its check sample G left upon incineration of the alcohol residue 16.19% ash. A remarkably high average is exhibited by A, and also in parts of B, D and E. In comparing the values of column 4, with those of column 3, we observe that the loss in weight caused by incineration of the residues varies between 17 and 26%, approximately corresponding to the amount of gum present in the resin.

Purified Asafoetida.

The writer is convinced that the quality of crude asafoetida is beyond the control of drug importers. This view is supported, not only by the returns in America but by the investigations reported in other countries.[10] In connection with this subject we are confronted with the fact that the source of asafoetida is such as to prevent any outside influenee from readily changing the methods of collectors. Indeed, it is not at all certain that as the drug must be brought to a mass-like consistence, it is practical to avoid varying proportions of earthy matters that are necessarily added primarily as absorbents. The very nature of the subject leads to the conclusion that the different consistencies of the juice and the

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* For explanation of asteriks see preceeding text.

[8] E. Dieterich; loc. cit.

[9] The Imperial Gazzetteer of India, Vol. 1, p. 37.

[10] loc. cit.

difference in the nature of the absorbents that vary from clay to calcium sulfate, would warrant the belief that while a package of pharmacopœial asafoetida is exceptionally a possibility, and that specimens of tears and fragments now and then nearly pure may be found in all samples, it is impractical for dealers at this period to supply any considerable quantity conforming to the U. S. P. requirements.

And yet, notwithstanding this fact, it is evident that in justice to the medical profession, the variation in commercial asafoetida should be overcome, and the writer favors the introduction of a purified asafoetida, made by abstracting the crude drug with alcohol and evaporating the alcohol. As thus produced the product has the consistence of a thin extract, not thick enough however, to roll into a pill, with an intense odor of asafoetida, and is practically soluble in alcohol. When rubbed with water it produces an emulsion superior to the emulsion that results with the commercial drug.

At first sight it might be supposed that a considerable amount of the volatile oil would be lost in this manipulation, but while a small portion distills with the alcohol, the amount is inconsiderable, at least when compared with the variation that exists in the commercial drug.

It may also be questioned by some persons as to whether the entire virtues of asafoetida are abstracted by alcohol, and yet one who examines the earthy residues will agree that such must be the case. In addition, we have the united testimony of the various pharmacopœias to the effect that the alcoholic test determines its value, as well as does the record of the chief official preparation, the tincture of asafoetida.

In the opinion of the writer it is impractical to obtain a uniform official drug, the only authentic preparation possible is that of purified asafoetida, and in no other direction is the necessity of intelligent supervision over a crude drug more urgent.

Additional substances to investigate.

Mineral matter as an admixture with asafoetida is not the only substance with which dealers have to contend. Even though a specimen will stand the pharmacopœial alcohol test, the asafoetida may be adulterated by the addition of foreign alcohol-soluble resins, a practice which has already come under the observation of the analyst.[11]

In order to detect the presence of such substances as offer no characteristic reactions, systematic investigations have been carried on in recent years with a view to determine certain constant numbers of the pure drug, after the manner in vogue in the analysis of fats and oils, such as the acid, the saponification, the ester and the iodine numbers. It is evident that marked deviations from figures thus obtained are strong indication of foreign admixture of resins.

In this connection we may point to the following literature on this phase of the subject.

A. Kremel, Prüfung der Balsame, Harze und Gummiharze, Jahresb. d. Pharm. 1886, p. 3.

E. Dieterich, Prüfung der Balsame, Harze und Gummiharze, Jahresb. d. Pharm. 1887, p. 16; 1888, p. 8; 1891, p. 11.

H. Beckurts and W. Brüche, Experimentelle Untersuchungen über die Werthbestimmung der Harze und Balsame, Jahresb. d. Pharm. 1892, p. 21.

The addition of rosin or of white turpentine, which substances are those most likely to be fraudulently used as admixtures, may easily be recognized by determining the acid number, represented by the amount of caustic alkali, expressed in milligrams, which neutralizes the free acid contained in 1 gram of pure resin. A few determinations were made with the samples of asafoetida on hand in order to test the feasability of this plan for commercial purposes.

The acid number of white turpentine and of rosin were first sought. Weighed quantities of the resins were dissolved in alcohol and the solution titrated with semi-normal caustic potash, phenolphtalein being used as an indicator.

White Turpentine:—

1) 0.7386 gms. in alcoholic solution consumed 4.06 cc. $\frac{n}{2}$ KOH.
2) 1.8465 gms. in alcoholic solution consumed 10.09 cc. $\frac{n}{2}$ KOH.
3) 3.6930 gms. in alcoholic solution consumed 20.19 cc. $\frac{n}{2}$ KOH.

Acid number calculated: 1) 153.9; 2) 152.9; 3) 153.1; average: 153.3.

Rosin:—

1) 3.2738 gms. in alcoholic solution consumed 19.4 cc. $\frac{n}{2}$ KOH.
2) 8.3138 gms. in alcoholic solution consumed 48.7 cc. $\frac{n}{2}$ KOH.

Acid number calculated: 1) 164.9; 2) 164.15; average: 164.5.

Asafoetida:—

Now as regards the determination of the acid number of asafoetida, a series of five experiments was undertaken. In the first, an alcoholic extract (in the composition of which all samples on hand participated) was evaporated on the water bath as nearly as possible to constant weight, a weighed quantity of the residue (purified asafoetida) taken up with alcohol and the solution titrated with semi-normal caustic potash, phenolphtalein being used as an indicator.[12]

In the four remaining cases, a weighed quantity of crude asafoetida was boiled out with alcohol, the residue weighed and the amount of resin operated upon was determined by difference.

In all cases, however, the acid number was referred to 1 gm. of alcohol-soluble substance, free from gum and mineral matter.

The results are as follows:—

I. Purified Asafoetida. 7.0276 gms. purified asafoetida consumed 7.8 cc. semi-normal caustic potash. Acid number, 31.1. This figure is most probably too low on account of the difficulty of completely expelling, on the water bath, alcohol and moisture from the viscid mass.

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[11] See for example, Th. Waage, Jahresb. d. Pharm. 1893, p. 198. Dr. T. L. A. Greve, of Cincinnati, has met with the commercial drug in which were imbedded large lumps of rosin.

[12] Special experimentation would be required to establish a method to titrate an alcoholic solution of asafoetida with absolute exactness as it is sometimes extremely difficult to define the exact point of neutralization. Fairly good results were obtained, however, when diluting the alcoholic solution with water and observing the point where a red coloration first appears upon dropping a solution of phenolphtalein on the surface of the turbid liquid. (See Kremel, loc. cit.)

II. Sample D_I. Dry and hard tears. 1.8719 gms. yielded to alcohol 1.4254 gms. soluble matter, consuming 3.5 cc. semi-normal caustic potash. Acid number, 68.8.

III. Sample C_I. Dry, hard tears. 4.7596 gms. yielded to alcohol 3.4193 gms. soluble matter, consuming 7.56 cc. semi-normal caustic potash. Acid number, 61.91.

IV. Sample G. Granular, sticky mass. 51.3620 gms. yielded to alcohol 34.2834 gms. soluble matter, consuming 40.65 cc. semi-normal caustic potash. Acid number, 37.7.

V. Sample A. Granular, sticky mass, similar in appearance to IV. 28.4974 gms. yielded to alcohol 9.7418 gms. soluble matter, consuming 14.06 cc. semi-normal caustic potash. Acid number, 40.4.

From these results it follows:—

1st, That all these samples are evidently free from any appreciable admixture of white turpentine or rosin. In an investigating experiment, where white turpentine was purposely added to purified asafoetida, its amount was almost quantitatively indicated by the increased acid number of the mixture.

2nd, That the acid numbers of the different asafoetida specimens and parts thereof, while decidedly lower than those of white turpentine or rosin, are far from being concordant among themselves, varying from 31.1 to 68.8.

Still there seems to exist some regularity in these figures, inasmuch as they may be divided into two groups, the dry, hard tears possessing the highest numbers, (61.9 and 68.8), and the semi-solid mass having a lower number ranging from 31.1 to 40.4, or (leaving out the probably erratic figure 31.1) from 37.7 to 40.4.

Such variations in the acid number of different specimens of asafoetida have been observed before, as the following table to which the foregoing results are appended, will indicate.

Table II.

Acid numbers.

Substance.	A. Kremel.*	E. Dieterich.*	Beckurts & Brüche.*	Our Results.
White Turpentine				153.3
Colophony (Rosin)	151—173	157—176	173—186	164.5
Asafoetida	26.8	11.2	40 *in massis*	61.9 dry tears
"	54.8	82.	29 *depurat.*	68.6 " "
"		70.	31 "	
"			43 *in massis*	37.7 soft mass
"			27 *in granis.*	40.4 " "

Summary.

I. The average amount of ash left in an ordinary specimen of commercially fair asafoetida is quite considerable, ranging in the samples herein treated, from 16% to about 20%. In some cases as high an average as 50% was observed. The purest tears left very little ash, ranging from 1.78 to 2.55%, and these selected tears yielded to alcohol as much as 76% of their weight.

II. The employment of a purified asafoetida is herein recommended, and the same should, in the writer's opinion, be the only official form of the drug for pharmaceutical use.

III. The U. S. Pharmacopœia should give directions by which to ascertain the absence of white turpentine and rosin.

IV. The acid number of asafoetida seems to be higher for dry tears than for asafoetida mass. In these experiments the acid numbers varied from 61.9 to 68.8 for dry tears, and from 37.7 to 40.4 for asafoetida in mass.

V. It is very difficult, although not always impossible to obtain in the American market asafoetida that will meet the requirements of the U. S. P., which demands that it should yield to alcohol at least 60% of its weight. In the writer's opinion, our importers are at the mercy of persons beyond their supervision, and to demand that crude asafoetida conform to the requirements of the Pharmacopœia, will probably render it impractical for them to offer the drug in any considerable quantity. In this connection, the reader is referred to a valuable editorial concerning asafoetida in the Chemist and Druggist, May 7th, 1892, from which the following points are extracted:—

"The fact cannot be too strongly impressed upon the exporters in the East that it always pays best to send first-class goods. These are certain to find a market, while adulterated articles may often lie for months in the warehouses, waiting for a buyer, and condemned ultimately to pass for an old song into the hands of one or another of those firms on the fringe of the drug trade, to whom nothing is unsalable provided it is low-priced.

"The principal buyers of asafoetida in this market are the representatives of American drug houses, and the Americans whether from necessity or choice, are notorious for the eagerness with which they buy drugs of the finest quality. It was American firms who purchased the bulk of the gum which has been sold at our auctions this year, and it is only by providing a supply of marketable wares that their custom, advantageous both to our importers and to the shippers in India and Persia, can be kept here in the long run."

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Halogen Derivatives of Thymol and Carvacrol.

By *Leo C. Urban.*

When thymol is acted upon in alkaline solution with iodine, a peculiar amorphous substitution product is formed. This product, known commercially as aristol, is considered as a derivative of dithymol and is represented by the formula $(C_{10}H_{12}OI)_2$ or structurally

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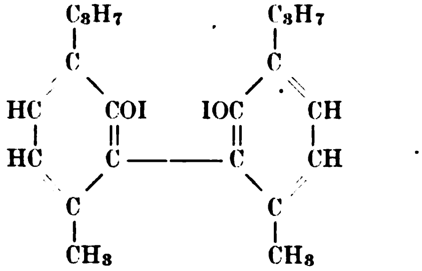
* loc. cit.



On account of its insolubility in alkalies, it is assumed that it is the hydrogen of the hydroxyl group which is replaced by the iodine.

The same compound is formed when to such an alkaline solution of the phenol, in which an alkaline iodide has been dissolved, a solution of chlorinated soda is added.

A carvacrol iodide, said to be prepared in an analogous manner to aristol, has been described as a bulky, yellowish brown amorphous powder having a melting point of about 90° C.

The writer has prepared a carvacrol iodide, quite different from the above, by the following process:

Two grams of carvacrol and 3.8 grams of potassium iodide are dissolved in 40 cc. of a ten percent aqueous solution of sodium hydroxide. To this a solution of chlorinated soda is gradually added under continuous stirring until no more of a precipitate is formed. During the reaction, the mixture is kept cool by placing the vessel in cold water. The precipitate is collected on a filter, and washed first with water to which a very small quantity of alkali has been added, and then with pure water. It is then allowed to dry at the temperature of the room.

The product is a bulky, grayish-yellow or buff-colored, amorphous powder, having a faint aromatic odor. It is soluble in ether, chloroform, benzin and the fixed oils. From its solution in chloroform and ether it is precipitated on the addition of alcohol, becoming paler in color. This purified product did not show signs of shrinking until above 170° C. and at 200° C. had become black and tarry, but had not liquified.

The same compound is obtained by adding very slowly, and under continuous stirring, to a solution of 2 grams of carvacrol in 40 cc. of a ten percent aqueous solution of sodium hydroxide, an aqueous solution of iodine in iodide of potassium, until a precipitate ceases to form.

It combines the antiseptic properties of carvacrol with those of iodine and possesses the advantage over iodoform in being odorless or nearly so and in being more than four times as bulky.

The formation of this iodine compound suggested the possibility of obtaining analogous bromine derivatives.

Thymol bromide was prepared in a manner analogous to that used in preparing the iodide. Two grams of thymol and 2.5 grams of potassium bromide are dissolved in 40 cc. of a ten percent solution of sodium hydroxide. To this solution there is gradually added, under continuous stirring, an excess of a freshly prepared solution of chlorinated soda, the mixture being kept cool by placing the container in a vessel of cold water. A yellowish, bulky precipitate is slowly formed which is collected upon a filter, thoroughly washed with water, and dried on bibulous paper at the temperature of the room.

It formed an amorphous, yellowish, bulky powder, becoming paler on exposure to light. It is odorless or nearly so, and soluble in ether, chloroform, benzin and the fixed oils. Its solution in ether showed signs of decomposition, hydrobromic acid splitting off. When heated to 130° C. it began to shrink and at 150° C. it had changed to a dark brown tarry mass, liquifying at about 162° C.

Bromine estimations kindly made according to Carius by Mr. O. Schreiner, gave the following results:

I. 0.17227 gram of substance gave 0.1421 gram AgBr=0.06046 gram Br.

II. 0.16791 gram of substance gave 0.13867 gram AgBr=0.059004 gram Br.

Calculated for		Found	
$C_{10}H_{13}OBr$	$(C_{10}H_{12}OBr)_2$	I	II
34.93%	35.08%	35.09%	35.14%

Carvacrol Bromide was prepared in the same manner as the thymol derivative, substituting carvacrol for the thymol. It formed an amorphous, grayish-yellow or pale buff-colored powder, odorless or nearly so. Soluble in ether, chloroform, benzin and the fixed oils. At about 130° C. it began to shrink, and at 150° had become black and tarry. An etherial solution of this compound also showed signs of decomposition, hydrobromic acid splitting off.

A bromine estimation (Carius' method) also furnished by Mr. O. Schreiner resulted as follows:

0.14556 gram substance gave 0.1196 gram AgBr=0.05088 gram Br.

Calculated for		Found
$C_{10}H_{13}OBr$	$(C_{10}H_{12}OBr)_2$	
34.93%	35.08%	34.96%

Similar compounds are formed by acting directly on the alkaline phenol solutions with an aqueous solution of bromine.

If the iodides are looked upon as derivatives of the diphenols, the bromides must also be considered as such.

Amorphous chlorides of the phenols are also formed by treating alkaline solutions of these with freshly prepared solution of chlorinated soda or with an aqueous solution of chlorine. These compounds will be reported upon shortly.

Laboratory of the Kremers & Urban Co.

Roentgen's Rays.

By *Dr. Louis Kahlenberg.*

Since the time when Professor Heinrich Herz conducted his famous investigations on the relations between light and electricity, no discovery in the realm of physics has attracted so much attention on the part of scientists and thinking men in general as has the latest discovery of Dr. Roentgen, Professor of Physics at the University of Würzburg. Much of the misunderstanding that at first existed concerning the nature of this discovery is already being cleared away; still the fact that many of the more recent newspaper articles contain statements that are erroneous and need to be discarded before the true import of Prof. Roentgen's discovery can be properly appreciated will justify a brief description of the work of this physicist.

The beautiful mild light that is produced when the electric spark is passed through a Geissler's tube is familiar to all that are acquainted with common electrical phenomena. A Geissler's tube is a closed glass tube containing rarefied air, or some other gas, and having platinum or aluminium wires, electrodes, fused into its ends. These wires extend into the inside of the tube, while on the outside they are provided with loops or hooks for the attachment of wires that lead to an induction coil or a frictional electrical machine. If such a tube containing air of $1/300$ of its ordinary density is connected with the poles of a powerful induction coil, the negative electrode (cathode) appears surrounded with a delicate, deep blue light, but from the positive electrode (anode) a beautiful light of the color of peach blossoms radiates into the tube filling it almost entirely, being separated from the blue light surrounding the cathode only by a dark space. This light streams from the anode towards the cathode, and if the tube is bent, follows all the crooks of the tube. If now the air is still further exhausted from the tube, the blue light surrounding the cathode, and the dark space that separates it from the light streaming from the anode expand more and more while the light from the anode recedes continually and finally disappears entirely. In tubes in which the air has been exhausted to about one-millionth of an atmosphere, this cathode light appears most intense. These cathode rays proceed in straight lines perpendicular to the surface of the cathode and their direction is not in the least influenced by the shape of the tube or the position of the anode. Where the rays of the cathode light strike the walls of the glass tube they cause the glass to emit a peculiar light of its own (fluorescence and phosphorescence). The cathode rays also cause many other substances to fluoresce. The color of the light emitted depends upon the nature of the substance. The Thuringian glass of which the Geissler tubes are often manufactured emits an apple-green light.

The properties of the cathode rays which have thus far been mentioned were first discovered by Prof. Hittorf of Münster, in 1869. Hittorf's work was verified by Crookes in 1879. The tubes that Crookes used contained cathodes that ended in metallic disks, either plane or concave. Crookes called these rays radiant matter and assumed in them a fourth state of matter. It is important to observe here that the luminous rays emitted from the cathode can be deflected from their course by a magnet. According to Hittorf, a pencil of luminous cathode rays behaves like a bundle of stiff fibres fastened only to the cathode, whereas the light from the anode behaves like a bundle of flexible fibres fastened at both ends. Two parallel pencils of luminous cathode rays repel each other.

In 1894 Herz found that cathode rays differ from ordinary light in that they penetrate more readily those solids through which ordinary light can pass only with great difficulty or not at all, as for example sheets of metal. Again he found that substances which transmit ordinary light readily proved an overwhelming obstacle to the cathode rays. In the same year Ph. Lenard,[1] working in the laboratory of Herz, experimented on the cathode rays and prepared some photographs, using this light.

It was with a view toward the further elaboration of these experiments that Roentgen was conducting researches with the cathode rays, and he found them to posess a most remarkable property. In a dark room he had a Crookes' tube emitting the cathode rays. The tube was enclosed in a black paste-board box so that no light whatever was visible. He noticed that a paper screen coated with a fluorescent substance (barium platino cyanide) was caused to emit a greenish fluorescent light when brought into the neighborhood of the tube. This fluorescence occured even when the coated paper was held at a distance of six feet from the tube. Now it was evident that this fluorescence was caused by rays of some kind that were being emitted from the Crookes' tube, rays which, however, do not act on the optic nerve. For the lack of a better name, Roentgen calls these rays X-rays for the present. By placing different objects between the Crookes' tube and the fluorescent screen, it was found that all were permeated to a greater or less extent by the X-rays. Thick wooden boards or plates of hard rubber interposed between the tube and the screen decreased the fluorescence but little, the rays also passed through a book of 1000 pages, through the fleshy parts of the hand and many other substances. Metals and glass were found to obstruct the passage of the rays very greatly, and when used in sufficient thickness did not allow them to pass at all. The objects all cast a more or less dark and sharply defined shadow on the fluorescent screen according as the substances of which they were composed were of greater or less density. Thus when the hand was interposed between the tube and the screen the bones of the hand gave a darker shadow than did the softer parts and so there appeared on the screen a dark shadow of the bones surrounded by a lighter shadow of the softer parts.

Now these X-rays have been found to act chemically upon ordinary photographic plates;[2] and when the screen of barium platino cyanide is replaced by a photographic plate (which by the way can remain in its paste-board or wooden holder, since X-rays easily pass through paste-board and wood) and an object, say the hand, is placed between the excited Crookes' tube and the plate, the latter will be protected from the action of the rays by the hand, as far as the latter covers it, much more, however, by the bones than by the fleshy parts. After exposing[3] the plate from ten minutes to an hour in the manner described, the plate is developed and fixed in the usual way. Thus a negative is obtained in which the bones of the hand appear light and the softer parts somewhat darker. From this negative pictures (positives) can be printed by the usual process. These pictures, it will be at once seen from what has been said, are simply shadow pictures of the objects taken. In these pictures the denser parts of the object appear darker than the parts less dense; thus in case of the hand the outlines of the bones appear much darker than those of the softer parts. As there is no **light** acting on the sensitive plate in the production of these pictures the latter can not be called photographs. The term **radiograph** has been suggested for them; whether this name will finally be adopted remains to be seen. The pictures differ too from ordinary photographs in that they are only shadow pictures or silhouettes of the objects taken. Several other such pictures were prepared by Roentgen. A set of weights in a closed wooden box yielded a picture in which the weights appeared as heavy dark shadows on a light back ground, showing the faint outlines of the box. Similarly a picture of the coins in a closed leather purse was taken, etc.

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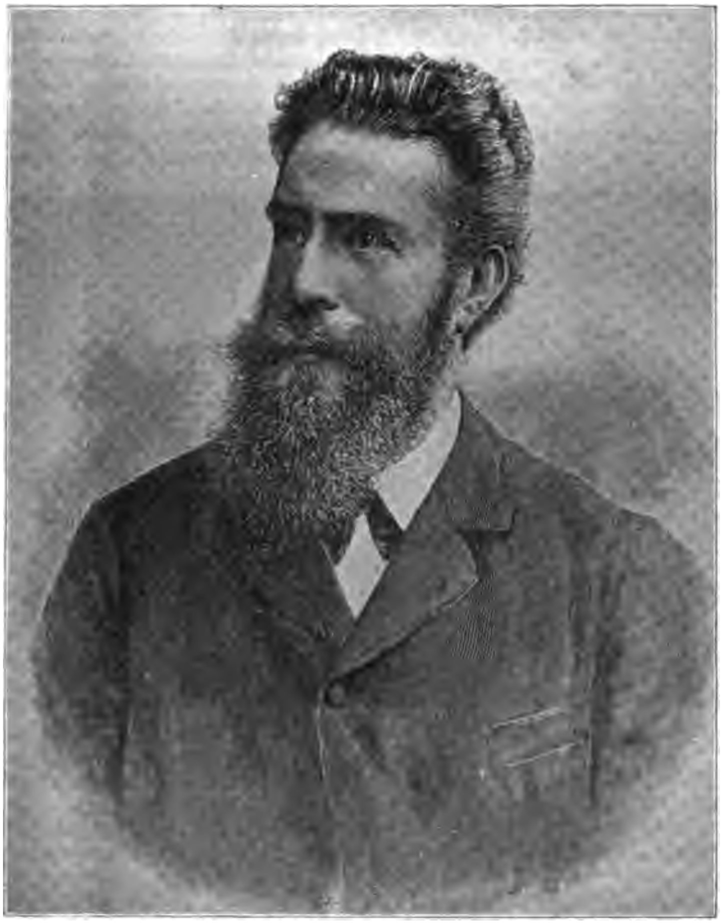
[1] Wiedemann's Annalen der Physik, vol. 51, p. 225. 1894. See also ibid., vol. 52, p 28, on "Magnetische Ablenkung der Kathodenstrahlen."

[2] Whether the rays act directly on the photographic plate, or whether the action is produced by fluorescent light formed as the rays strike the plate is a question that Roentgen leaves open.

[3] A camera is of course not needed in this work, as is evident from what has been stated. Lenses are not only unnecessary but can not be used, because glass, being quite dense, offers a great obstacle to the passage of X-rays.

These experiments have been verified by many physicists in Europe and America. At the University of Wisconsin such pictures were also prepared by Dr. L. W. Austin, who has kindly furnished the negative from which the accompanying figure has been prepared.



Prof. W. C. Roentgen.

As to the practical use to which the X-rays can be put, many speculations are being made. At present the rays are chiefly being used to prepare pictures such as have been described. Imperfect as this method of taking pictures still is, medical men have already used pictures thus prepared in making diagnoses. Thus bullets and needles that had penetrated different parts of the body have been accurately located and consequently easily removed. Cases where coins and other metallic bodies had been lodged in the digestive tract, have also been successfully diagnosed by the aid of pictures taken by means of X-rays. Surgeons have been able to inspect fractures and deformities of the bones by the aid of this method, and in Vienna lately a case of urinary calculus has been diagnosed by means of this new kind of photographs, if we may so call them. Thus the new discovery has already proved itself of practical importance to medical practitioners. That it will become still more valuable in this line as the process of taking the pictures is more perfected there can be no doubt.

Engineers and metallurgists are attempting to avail themselves of these shadow pictures produced by X-rays in locating defects in iron and other metals. It is to be hoped that their efforts in this direction will be crowned with success.

From the scientific standpoint of view, the interesting question arises, — what is the nature of these X-rays of Roentgen? Attempts that have been made to refract these rays have proved unsuccessful; for this reason it has not as yet been possible to concentrate these rays by means of a lens of any kind, and so the pictures that have been prepared thus far are as large as the objects themselves. Attempts to reflect X-rays have also been futile thus far. It has been determined that the intensity of the fluorescence on the screen varies inversely as the square of the distance of the screen from the Crookes' tube.

At first one would be inclined to suppose that the X-rays are cathode rays. Roentgen rejects this view mainly for the reason that X-rays cannot be deflected by a magnet as can cathode rays. Goldstein of Berlin claims to have shown that cathode rays consist of more than one kind of rays, and that while certain ones of these rays are deflected by a magnet, others are not at all influenced even by the most powerful magnets. Thus it might be that after all X-rays form a part of the cathode rays, which according to Goldstein are composite. Roentgen, however, is of the opinion that X-rays are produced when the light strikes the glass sides of the tube and produce fluorescence. The possibility that X-rays might be identical with the ultra-violet of the spectrum is also discussed by Roentgen, but discarded because X-rays have entirely different properties from those of the ultra-violet or ultra-red rays of the spectrum that have thus far been investigated.

Roentgen first made his researches public in a preliminary report before the "physikalisch-medizinische Gesellschaft" of Würzburg. Later appeared a ten-page pamphlet[4] containing this report. To elucidate the matter considered in the two preceding paragraphs further, little better can be done than to quote Prof. Roentgen's own words with which he closes his pamphlet.

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[4] Publisher, Stahel in Würzburg.

"Legt man sich die Frage vor, was denn die X-Strahlen, — die keine Kathodenstrahlen sein können, — eigentlich sind, so wird man vielleicht im ersten Augenblick, verleitet durch ihre lebhafte Fluorescenz und chemische Wirkungen an ultravioletten Licht zu denken. Indessen stösst man doch sofort auf schwerwiegende Bedenken.

a) dass es beim Uebergang aus Luft in Wasser, Schwefelkohlenstoff, Aluminium, Steinsalz, Glas, Zink, keine merkliche Brechung erleiden kann;

b) dass es von den genannten Körpern nicht merklich regelmässig reflektiert werden kann;

c) dass es somit durch die sonst gebräuchlichen Mittel nicht polarisirt werden kann;

d) dass die Absorption desselben von keiner anderen Eigenschaft der Körper so beeinflusst wird als von ihrer Dichte.

Reproduction of a negative taken with Roentgen's rays.

Das heisst man müsste annehmen, dass sich diese ultravioletten Strahlen ganz anders verhalten als die bisher bekannten ultrarothen, sichtbaren und ultravioletten Strahlen. Dazu habe ich mich nicht entschliessen können und nach einer anderen Erklärung gesucht.

Eine Art von Verwandtschaft zwischen den neuen Strahlen und den Lichtstrahlen scheint zu bestehen, wenigstens deutet die Schattenbildung, die Fluorescenz und die chemische Wirkung, welche bei beiden Strahlenarten vorkommen, darauf hin. Nun weiss man schon seit langer Zeit, dass ausser den transversalen Lichtschwingungen auch longitudinale Schwingungen im Aether vorkommen können, und nach Ansicht verschiedener Physiker vorkommen müssen. Freilich ist ihre Existenz bis jetzt noch nicht evident nachgewiesen, und sind desshalb ihre Eigenschaften noch nicht experimentell untersucht.

Sollten nun die neuen Strahlen nicht longitudinalen Schwingungen im Aether zuzuschreiben sein? Ich muss bekennen, dass ich mich im Laufe der Untersuchung immer mehr mit diesem Gedanken vertraut gemacht habe und gestatte mir denn auch diese Vermuthung hier auszusprechen, wiewohl ich mir sehr wohl bewusst bin, dass die gegebene Erklärung einer weiteren Begründung bedarf."

Professor Boltzmann shares Roentgen's view that the X-rays are longitudinal vibrations of the ether. Boltzmann thinks that the cathode rays as well as the X-rays are longitudinal waves of the ether, the former of very short and the latter of greater wave length; side by side with these waves he places the waves discovered by Herz as transverse waves of large wave length. According to Boltzmann the greatest value of Roentgen's discovery lies in the fact that through it we have become acquainted with an entirely new agent. The discovery of the rays of Herz and also of the cathode rays attracted much attention, though the former are not essentially different from light rays and the latter are confined within the space of a Hittorf's tube and consequently are of little use in science and the arts. The X-rays, however, are entirely new. They radiate out into space and through the efforts of their discoverer, Roentgen, have already proved themselves very valuable.

The Pharmaceutische Post of Jan. 26, attempts to point out a connection between Roentgen's rays and a "peculiar fluid" which Carl von Reichenbach called "Od." Reichenbach, the discoverer of creosote and paraffin, who died Jan. 16, 1869, published several works, the most important of which was entitled, "Der sensitive Mensch und sein Verhalten zum Od."[5] Later appeared "Die odische Lohe" published by Braumüller, then followed "Odisch-magnetische Briefe." In these books Reichenbach speaks of a peculiar fluid by means of which "sensitive persons" are able to see distinctly objects enclosed in metallic boxes and to recognize certain parts in the interior of the human body. The Post claims that a further analogy between Reichenbach's "Od" phenomena and Roentgen's rays exists because Reichenbach claims to have photographed shadow pictures in the dark by means of the "Odlicht." A sensitive plate prepared by coating one side with a layer of a silver salt was used, and when the sensitive side was turned toward the object the silhouette-like pictures were obtained, whereas, when the other side of the plate was turned toward the object the process was not always successful. Whether the claims of the "Post" be well founded or not is a question that can only be settled by further investigation. It should not be disguised either that there are many that would be inclined to question Reichenbach's observations.

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[5] Cotta, Stuttgart, 1854.

A late number of The Chemist and Druggist contains an account of the meeting of the Academy of Sciences at Paris Jan. 27. The salient points in the report of this meeting are here given. Prof. Lannelongue discussed the application of the new discovery to surgical diagnosis. He confirmed many of the statements that had been made concerning the localizing of injuries and diseases of the bones and states that good results had also been obtained in diagnosing the area of tuberculosis in the hand. M. Perrin, of the physical laboratory of the École Normal, said he had corroberated Roentgen's experiments, and had found that X-rays were not at all reflected nor refracted. He shared the view of Roentgen that the rays are not cathodic, saying that the two are no more alike than are the hammer that strikes the bell and the sound that is produced. M. G. Le Bon then made the startling statement that he could do with ordinary light what had been done with X-rays. He placed a negative over a sensitive plate, put the two in a light-tight box made of iron and lead, and before the iron plate of the front of the box he placed an ordinary paraffin lamp. In less than three hours he obtained a negative. M. Le Bon's idea is that the whole thing is done by heat rays.

Without entering into further discussion concerning the matter, it appears from what has been said concerning the properties of X-rays and from the process used by M. Le Bon, that the latter is dealing with an entirely different phenomenon.

The attention that X-rays are at present receiving at the hands of so many able experimentors, would lead us to hope that the process of taking pictures by their action will ere long become much more perfect and consequently more useful than it now is. Already the time of exposures (from ten minutes to an hour) is being reduced and sharper pictures are being obtained. It is to be hoped that a means of concentrating these rays will ere long be found. What we may expect of these wonderful rays of Roentgen as casting light upon our knowledge of radiant energy in general and as furnishing other practical applications, further investigations only can reveal.

MONTHLY REVIEW.

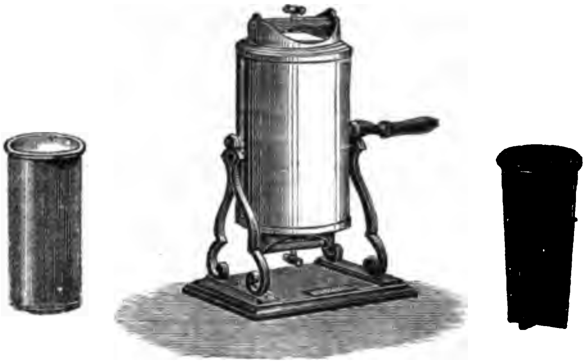
Pharmaceutical Technique.

Ice Machine.

The firm of Warmbrunn, Quilitz & Co. of Berlin, has recently brought out a small ice machine, which may be of use to druggists of small towns, especially in warm countries where ice is difficultly obtainable.

The machine, (see cut), consists of a double-walled tin cylinder, covered with asbestos and intended to hold the freezing mixture; and the inside tin vessel, cross-shaped in transverse section, in which the ice is formed. The tin cylinder rests on an axis and can be rotated by means of a crank.

To prepare ice the operator proceeds as follows: The inner vessel is filled to within a cm. from the top with as cold water as can be procured; distilled water previously boiled and cooled should be used if germ-free ice is desired. The vessel is then covered with a thick sheet of rubber, a tin plate placed over this and the cover screwed on. The machine is now inverted and 3 kg. of dry ammonium nitrate are poured into the cylinder, followed by 3 litres of cold water, after which the cover is secured. After turning for 20 minutes, the cover is quickly removed and the inner vessel taken out and dipped into hot water, when the ice will drop out by simply inverting the vessel.

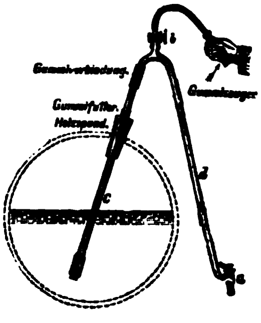


The action of the machine depends upon the absorption of heat when dissolving the ammonium nitrate in water, the reduction of temperature in this case being about 25° C. The colder the materials, the more rapidly will the ice be formed, of course. Water above 15° C. should never be used; if it is impossible to cool the water in any other way, it should be placed in a vessel surrounded by a freshly-prepared solution of ammonium nitrate.

After the ice has been formed, the liquid in the cylinder generally has a temperature below zero (C.), and can still be used for cooling beverages and the like. The yield of ice by this machine is 500 gms. in 20 minutes, and since the ammonium nitrate can be recovered by evaporation of the solution, the expense is very slight. [N. Ph. Manual, VI, Nachtrag.]

A New Siphon.

A patent siphon has recently been put on the market by the firm, Hch. Hartwig of Gehberg, Thüringen, Germ., of which the following is a reproduction:



The siphon is placed in the liquid, the stop-cock *a* closed, *b* opened, and the liquid made to rise in the shank *c* by means of the rubber suction-bulb. The shank *d* is filled by the overflow of *c*, but care must be taken not to apply the suction too rapidly, to avoid sucking up any of the liquid into the bulb. The stop-cock *b* having been closed, the siphon is ready for work.

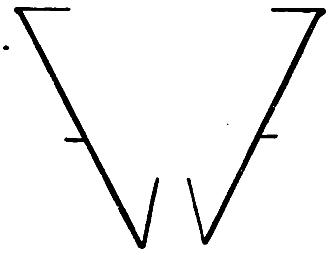
If it is desired to fasten the siphon so that the shank *c* shall not move, special wooden bungs are used. The rubber connection is loosened, the shank inserted in the bung from the bottom upwards, and is fastened by placing a piece of rubber tubing between the wood and the glass. The bung is fastened into the barrel or carboy, the shank forced down to near the bottom of the vessel, and the connections again made.

To empty the siphon, the suction bulb is removed, *b* opened, and the shank *c* emptied by raising the valve at the bottom by means of a wire or stick. The shank *d* is emptied through *a*.

[N. Ph. Manual, VI, Nachtrag.]

Heat-collector for Evaporation and Boiling.

During the process of evaporation over a free flame, on a wire gauze or a sand-bath spirting is apt to occur toward the end of the operation unless a very small flame is used. In this case, however, the duration of the process is inconveniently prolonged. In order to concentrate the heat and to evaporate as rapidly as possible with a small flame Drs. Peters and Rost of Berlin have constructed the following apparatus.



A cone of sheet iron, which can be mounted on a tripod by means of small lateral projections, is coated with asbestos on the outside. The lower end of the cone is provided with a chimney as illustrated by the accompanying cut.

Half a liter of water, which under given conditions of surface of evaporation and of flame required seven and one half hours for complete evaporation, in the same evaporating dish and with the same flame required but two hours for complete evaporation when this heat-collector was used. Similar experiences were had with salt solutions. All experiments conducted clearly show that the same result can be accomplished in much less time and with less fuel with this heat jacket than without it. Copper rings are used to adapt the heat-collector to evaporating dishes of different sizes.

Chemistry.

Synthetic Cassia Oil.

It has been shown by the chemists of Schimmel & Co.* that cinnamic aldehyde is the only essential constituent of cassia oil, as far as flavor is concerned. The Chinese oil is so grossly adulterated with petroleum and colophonium that oils which ought to contain at least 75% aldehyde contain not more than 35 to 50 percent. Aside from the low percentage of aldehyde the adulterants are decidedly objectionable. Synthetic cinnamic aldehyde has now not only become possible on a commercial scale, but can be produced so cheap, that it will no doubt replace the natural product. This result may have a wholesome effect on the Chinese traders in teaching them the lesson that modern synthetic chemistry defies their cunning.

The Existence of Aluminium Borate.

Until recently it was generally supposed that solutions of borax and alum act on each other with the formation of a basic aluminium borate. About the middle of last year the announcement was made that this precipitate was not a borate at all, but aluminium hydroxide pure and simple. J. Martenson recently had occasion to doubt this new claim. In going over the work he produces results, which he states agree well with the older statements of H. Rose.

[Oesterr. Zeitsch. f. Pharm., 50, p. 80.]

Preparation of Vanillin.

The different methods according to which vanillin can be prepared have been summarized by J. Altschul as follows:

1.) Upon oxidation of aliphatic side chains, vanillin has been obtained from the following substances: a.) coniferin, glycovanillin, olioil, acethomovanillinic acid, acetferulaic acid; b.) eugenol, isoeugenol, aceteugenol, eugenolacetic acid, acetisoeugenol, benzylisoeugenol, methyleneisoeugenol, isoeugenolphenylacetic acid, isoeugenoltoluic acid.

2.) *p*-nitro-*m*-methoxybenzoic aldehyde, which can be converted into vanillin, has been obtained from the following substances: toluene (through *p*-nitro-*m*-chlortoluene), cinnamic acid (through *m*-methoxycinnamic-acidester), benzaldehyde (through *m*-amidobenzaldehyde.)

3.) The following derivatives of protocatechuic aldehyde can be methylated and thus converted into vanillin: the bimetallic salts, monoacetylderivative, benzyl-compound and benzene-sulphonate.

4.) Guaiacol can be converted into vanillin: a.) by introducing an aldehyde group upon treatment with chloroform and caustic potash; b.) by introducing an aldehyde group into guaiacolcarbonic acid and splitting off carbon dioxide; c.) through guaiacol dicarbonic acid. [Pharm. Centralh. N. F., 16, p. 721.]

Occurrence of two kinds of Mannan in the Roots of Conophallus Konyaku.

It was shown by Tsuji that the root of *Conophallus* contains a large amount of an anhydride of mannose; it is now shown by Y. Kinoshita that two kinds of mannan are present. The finely ground root was repeatedly extracted with boiling water until the extract was no longer slimy. The residue yielded mannose when boiled with dilute acid, and the slimy extract, on the addition of alcohol, yielded a copious, nearly white, flocculent precipitate; the latter when dried at 100°, was no longer soluble in water, but yielded mannose when boiled for some hours with 4 per cent sulphuric acid. This mannan differs from that obtained from yeast by Salkowski in losing its solubility on drying, but agrees in its behavior with basic lead acetate (no precipitate), ferric chloride, and ammonia (gelatinous precipitate), copper sulphate and sodium hydroxide (thick, blue precipitate), and also with Fehling's solution.

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* See *Bericht* for 1889, 1890 and 1891.

The slimy mannan was not altered by the diastase of malt, by invertase or emulsin, and Osawa's experiments on dogs showed that it is digested with much more difficulty than starch. An enzyme capable of saccharifying the mannan must, however, exist in the konyaku root, and the author hopes to isolate it.

[J. C, S., 70^{II}, p. 60; from Bull. Coll. Agric., Imp. Univ. Tokyo, 2, p. 205.]

Conversion of Chlorine into Hydrogen Chloride.

According to **Richard Lorenz**, chlorine is completely converted into hydrogen chloride by passing it, mixed with steam, through a tube filled with coke, and heated to a faint red heat. The action is expressed by the equation $2Cl+H_2O+C=2HCl+CO$, and so complete is it that the gases issuing from the hot tube do not contain sufficient chlorine to give a reaction with potassium iodide and starch. After absorption of the hydrogen chloride by means of water, the residual gas is almost pure carbonic oxide, containing only a very small quantity of carbonic anhydride.

[J. C. S., 70^{II}, p. 17; from Zeit. anorg. Chem., 10, p. 25.]

Preparation of Tin Tetrachloride in Large Quantities.

Richard Lorenz has demonstrated that tin tetrachloride is most easily prepared by the action of chlorine on tin at the ordinary temperature. The most suitable apparatus is a tube closed at one end, 5 to 6 cm. wide, and 75 to 100 cm. long, fitted with a condenser and a tube by means of which dry chlorine can be passed to the bottom of the tube, where it bubbles through a little tin tetrachloride. The tube is filled nearly to the top with granulated tin. 1½ to 2 kilos. of the tetrachloride are easily prepared in about one hour. The product is pure, and boils at 114°.

[J. C. S., 70^{II}, p. 28; from Zeit. anorg. Chem., 1895, p. 44.]

Calcium Permanganate.

This salt is prepared by decomposing a solution of barium permanganate with calcium sulphate, filtering, concentrating the filtrate, and crystallizing. The crystals formed resemble those of potassium permanganate, and are freely soluble in water. In its antiseptic action, calcium permanganate is said to be 100 times as strong as the corresponding potassium salt, or even stronger than mercuric chloride. Because neither caustic nor toxic, it can be used for sterilizing drinking waters.

[Zeitsch. des allgem. österreich. Apoth. Ver., 1895, p. 796.]

Botany and Pharmacognosy.

Camphorleaf Oil.

In view of the rapid depletion of the natural camphor forests of Japan and of Formosa, attempts to cultivate the tree in other countries have been made and have met with more or less success. The camphor tree has been found to flourish in India and Ceylon; it has become naturalized in Java, Brazil, Jamaica and others of the West Indian islands as well as in Mauritius and Maciva. In our own land it is now cultivated in Florida and California.

Since in the Orient only the wood of the older trees is said to be used, the branches and leaves being discarded, the question arises concerning the camphor-content of these parts. **David Hooper** has given results bearing on this point. Fifty pounds of leaves from a tree grown at Ootacamund in India were distilled in water for six hours giving eight fluidounces of oil, a yield of one percent of essential oil. The color was slightly yellow, specific gravity at 15° C., 0.9322 and a rotation of + 9.4 in a two decimeter tube was found. It began to boil at 175°. The quantity of camphor obtained was small.

A second sample of leaves was obtained from Naduvatam, a situation about 1000 feet lower than the former. A treatment similar to the above yielded four ounces of liquid and a mass of crystalline matter suspended in it. On straining off the oil through a cloth, a cake of camphor weighing two ounces remained. The clear oil had a specific gravity of 0.9314 at 15° C., rotated a ray + 54° in a two decimeter tube and boiled regularly at 165°. Taking into account the camphor condensed in the cool tube, the oil from this sample yielded about 75 percent of camphor. It is regarded by the author as probable that further decrease of elevation would still further increase the yield in camphor. [Pharm. Jour., 1896, p. 21.]

Ramie.

According to **C. O. Bornig**, ramie, the fibre derived from *Boehmeria*, is the material of the ancients, which has been called linen and cotton by translators. The fibre is an extraordinarily pure cellulose exceeding even cotton in purity, and by improved methods of preparation becomes a rival to silk in lustre and susceptibility to color. The fibre is long and very strong, and is capable of being woven into cloth of almost any texture. The native ***B. cylindrica*** has a good quality of fibre, but the species usually cultivated is ***B. nivea***. The latter is grown in Louisiana, Texas and California, and as a manufactured article reaches this country from China under the name of China grass cloth.

[Bot. Gazette, 21, p. 98; from Dry Goods Bulletin 18, p. 12.]

Cuscuta Epithymum.

The common dodder is a parasitic plant of the order *Convolvulaceæ*, and is said to possess diuretic and laxative properties, and to be a specific for gout. **Gaston Barbey** has examined the extract from 2 kilos. of the plant. The aqueous extract is acid and yields a precipitate with potassium hydrogen carbonate, from which a yellow, amorphous powder, cuscutin, is extracted by ether. It is also precipitated by dilute sulphuric acid, and the residual solution then reduces alkaline copper tartrate. The alcoholic extract of the residue from the aqueous extract, yields a further quantity of cuscutin. Resinous and fatty products were also isolated, together with a tannin and a small amount of a crystalline substance, having a faint odor of cumarin.

Cuscutin is insoluble in cold water, and only sparingly soluble in boiling water, yielding a yellow solution, from which it is precipitated in the amorphous form on cooling; with concentrated sulphuric acid it gives a reddish-brown solution, having a green fluorescence; it is also soluble in acetic acid without change of color. With ferric chloride, the aqueous solution gives a characteristic and very delicate violet-grey turbidity, red by transmitted light. Cuscutin is very soluble in alkalies, giving yellow solutions, which dye silk and paper and stain the skin. Cuscutin is hydrolysed by mineral acids yielding glucose, and a resinous substance, cuscuretin, and it is, therefore, a glucoside. No analytical data are furnished.

[J. C. S., 70^{II}, p. 65; from J. Pharm., 1895, [6], 2, p. 107.]

Practical Pharmacy.

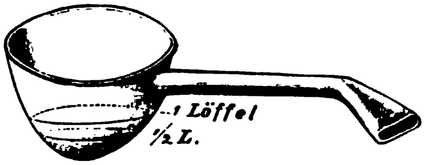
Adulteration of Codeine.

Upon dissolving some codeine in 50—60% alcohol, J. Etiévant found that the solution was turbid and after a short time a white sediment appeared. This latter was easily soluble in water and upon closer examination proved to be sugar. The codeine had been adulterated with rock-candy, the crystals of which resemble those of codeine very closely. Upon dissolving the mixture in hot water, adding a few drops of sulphuric acid, neutralizing with caustic potash, and the subsequent addition of Fehling's solution, the adulteration of codeine with sugar is easily detected. Besides this, the difference in optical properties could be used; sugar is dextro-, codeine laevo-rotatory.

[Rep. de Pharm., 1895, p. 11.]

Medicine Spoon.

The firm of Becker and Marxhausen in Kassel has introduced a glass medicine spoon called *Bequem* (convenient), which is deserving of its name wherever it is disirable to administer medicines or liquid food to patients in a lying position. The spoon has a capacity of 600 cc., is graduated on the outside and can easily be kept clean. The spilling of liquid is excluded inasmuch as the liquid is not administered by means of the bowl, but through the handle.



[Illustr. Ztg., 1896, p. 89.]

Sulphur as a Preservative of Chloroform.

According to L. Allain, chloroform saturated with sulphur in the cold may be kept in direct sunlight for months, without undergoing change; in particular, no carbonyl chloride is formed. This stability is not due to any change produced by the sulphur, for the redistilled liquid rapidly decomposes when exposed to the same conditions. As the anæsthetic properties of the chloroform are not modified by the presence of the sulphur, the addition of this preservative is to be recommended.

[J. C. S., 70^{I}, p. 3; from J. Pharm., 1895, [6] 2, p. 252.]

Sulphume Remedies.

These remedies, manufactured by the Sulphume Co. of Chicago, were analyzed by H. Wefers-Bettink and J. van Eyk. A solution, salve, and pills were examined. The solution was found to be essentially a solution of calcium polysulphides, the well-known solution obtained by boiling sulphur with milk of lime. The "Sulphume Ointment" contained about 2.5% of calcium polysulphides, dissolved in water, mixed with yellow vaseline and perfumed with expressed oil of nutmeg. The "Sulphume Pills" contained some free sulphur (probably formed by the decomposition of the polysulphides in contact with organic matter): also podophyllin, with licorice root extract, and wheat-starch as excipients. [Apoth. Zeit., 1896, p. 27; from Nederlandsche Tydschrift voor Pharm., 1896, p. 14.]

Bromidia.

According to the manufacturers, Battle and Co., St. Louis, one teaspoonful of Bromidia contains 1 gm. each of chloral hydrate and potassium bromide, together with 0.008 gm. each of extracts of *Cannabis Indica* and *Hyoscyamus*, and aromatic extracts. According to recent analysis, 15% each of chloral hydrate and potassium bromide were found; also 11% of sugar, though this result may be too high due to the probable presence of glycyrrhizin from extract of liquorice. No reactions were found that corresponded to those produced by known extract of Cannabis Indica; and this, together with the fact that too little alcohol is present in the preparation to dissolve such a resinous extract, leads the analyst to doubt the presence of any Indian Hemp whatsoever. Hyoscyamine was indicated by Vitali's reaction and the mydriatic effect of the alkaloids extracted. Morphine was found to be absent.

[Pharm. Ztg., 1895, p. 749.]

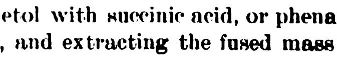
On the Preservation of Inks.

Most inks, but especially those containing gums or sugar, are liable to decomposition, due either to a fungus growth on their surface, to their becoming slimy, or to the production of lactic acid which destroys the coloring matter. The latter two causes are due to the growth of bacteria in the ink. Copperas and alum have both been used as preservative agents and are quite effective in retarding or preventing bacterial or fungus growths, but inks to which these salts have been added are apt to lose color upon standing. Carbolic acid in quantities of 0.1% or even less prevents all decomposition of inks but its disagreeable odor prevents its extensive use. It has been found that 0.1—0.2 gms. of salicylic acid added to a liter of any ink will preserve the same indefinitely, while being free from all the objections above mentioned.

[Neueste Erfindungen und Erfahrungen, 1896, p. 62.]

Pyrantine, a new Antipyretic.

This substance, first prepared by A. Pintti, is *p*-aethoxylphenylsuccinimid:



$$\begin{array}{l} CH_2\text{—}CO\diagdown \\ | \qquad\qquad\qquad N\text{—}C_6H_4\text{—}OC_2H_5. \\ CH_2\text{—}CO\diagup \end{array}$$

It is made by fusing the hydrochloric acid salt of *p*-amidophenetol with succinic acid, or phenacetine with succinic acid, and extracting the fused mass with boiling alcohol. Pyrantine crystallizes in colorless, prismatic needles, melting at 155° C., insoluble in ether, almost insoluble in cold water, soluble in 83.6 parts of boiling water. By the action of alkalies it is converted into the salts of *p*-aethoxylphenylsuccinamic acid, which are soluble in water and can therefore be used subcutaneously. Pyrantine used in the clinics at the Universities of Naples, Padua, and Pavia was found to reduce the body temperature 1°—3° C., without having any action on the blood. Neither were any bad effects noticed on the heart, the respiration, or the organs of digestion. Pyrantine is especially recommended for rheumatic fevers in doses of 1—3 gms. daily.

[Chem. Zeit., 1896, p. 54.]

Food Stuffs.

Copper in Wine.

The substitution of copper sulphate for flowers of sulphur in combatting diseases of the grape-vine, though more economic, appears to be accompanied, at least at times, with rather serious results. Prof. H. **Karsten** attributes the cholera, which he found in central Switzerland in almost epidemic form, to the presence of copper in wine. A knife-blade placed in a tumbler of wine for twelve hours was covered with a readily perceptible coating of copper. He further supposes that the copper got into the wine through its use as a disinfectant on the grape-vine.

[Oesterr. Zeitsch. f. Pharm., 50, p. 84.]

Iron in Food.

Almost the only data with regard to the amount of iron in food, are those of Boussingault (Compt. rend., 74, 1352), and his results are too high. The great difficulty in work of this kind is complete incineration; which in the present research, by **Ralph Stockman**, was accomplished by heating the ash with a mixture of hydrochloric and sulphuric acids; the residue was then taken up with dilute sulphuric acid, reduced with zinc, and titrated with potassium permanganate.

The ordinary daily diet was found to contain about 9 or 10 milligrams of iron; but in chlorotic people who take but little food, the amount was about 3 milligrams. The following articles of diet were also analysed in the same way.

Milk from 2 to 4.3 milligrams per litre.

Oat meal 3.5 milligrams per 100 grams (dried).

Bread from 0.61 to 0.85 milligrams per 100 grams (dried).

Yellow ox marrow 2.5 to 4 milligrams per 100 grams (dried).

Red calf marrow 7.6 to 8.7 milligrams per 100 grams (dried).

Beefsteak 3.9 milligrams per 100 grams (dried).

[J. C. S., 70^{II}, p. 43; from J. Physiol., 18, p. 484.]

Mannan as Human Food.

From the tuberous roots of *Conophallus konyaku*, a food consisting of colorless, gelatinous tablets, is prepared and is largely consumed in Japan. It is made, according to **C. Tsuji**, by mixing the ground root with slaked lime (1 part) and water (2 parts), after which it is boiled with lime water until it forms a gelatinous mass.

When boiled with 3 per cent. sulphuric acid, the root yielded 55.86 per cent of mannose, assuming the whole of the sugar present to be mannose, as is very probable. The mannan present in the root must be digested by the enzymes in the intestines, and transformed into mannose or a dimannose, corresponding with the maltose made from starch. Attempts to convert the mannan of konyaku into a sugar by means of diastase from malt were unsuccessful.

[J. C. S., 70^{II}; from Bull. Coll. Agric. Imp. Univ Tokyo, 2, p. 103.

Bacteriology.

Sodium Fluoride as Antiseptic.

According to the *Nouveaux Remèdes*, fluoride of sodium, fluorol, is reported by **Duclos** to be a valuable antiseptic. It is prepared in the form of a bluish-white, odorless powder of saline taste. It is preferable to sublimate which is sixteen times more poisonous, also to silver nitrate, formalin and permanganate, for when employed in hypodermic injections it is painless. In one per cent. or even half per cent. solutions, it acts as a powerful germicide. Lagrange states that probably its efficiency is due to the fact that it does not coagulate albumen like sublimate, consequently the microbes are not protected by an envelope of coagulate albumen. It is especially useful in ophthalmic practice; the lachrymal mucous membrane tolerates injections of fluorol without the least reaction since it is neither caustic nor painful and provokes no irritation.

[Pharmaceutical Journal, 1896, p. 33.]

Physiology, Pharmacology and Therapy.

Formation of Blood from Organic Iron.

As a contribution to the disputed question whether organic iron is absorbed and contributes to blood (hæmoglobin) formation, **Jos. A. Kunkel**, made experiments on two puppies; one received milk, in which the amount of iron was ascertained, the other the same food **plus** iron. The milk contained about 1 milligram of metallic iron (1.4 milligrams Fe_2O_3) per litre. The extra iron given daily was 30 drops of *liquor ferri albuminati* of the German Pharmacopœia (= 4.4 milligrams of iron.) During life the blood was examined at weekly intervals. After death, other organs were submitted to analysis. The main facts are given in the following table. It shows a greater amount of iron in the dog to which iron had been administered.

	Dog A, with iron.		Dog B, without iron.	
Percentage of Fe_2O_3 in blood in successive weeks.	1. 0.0486	5. 0.0363	1. 0.0448	5. 0.0234
	2. 0.0388	6. 0.0384	2. 0.0503	6. 0.0227
	3. 0.0286	7. 0.0348	3. 0.0259	7. 0.0195
	4. 0.0334	—	4. 0.0303	—
After death.	Weight.	Total Fe_2O_3.	Weight.	Total Fe_2O_3.
	grams	gram	grams	gram
1. Total blood	—	0.0404	—	0.0252
2. Liver..........	133.8	0.0317	151.2	0.0043
3. Spleen.........	7.2	0.0043	7.8	0.0013
4. Kidneys.....	27.0	0.0025	30.2	0.0014
5. Ribs...........	11.1	0.0011	9.9	0.0001

[J. C. S., 70^{II}, p. 47; from Pflüger's Archiv., 61, p. 595.]

Toxic Substance from the Supra-renal Capsules.

According to D. Gourfein, the glycerol extract of the supra-renal capsules contains proteids which are precipitated by alcohol, and have little or no toxic effect, together with substances which are not precipitated by alcohol and are highly toxic. As the latter are not decomposed by heat, the capsules can be extracted with hot water, the solution precipitated by alcohol, and the clear liquid evaporated on a water bath. The product when injected subcutaneously causes death in a short time, and seems to act on the central nervous system. The proportion of the poison in the supra-renal capsules is variable, but no similar effects are produced by extracts of the spleen or the muscle of the same animals treated in the same way.

[J.C.S., 70 , p. 49; from Compt. rend., 121, p. 311.]

Succus Entericus of Sheep.

The intestinal juice has been investigated chiefly in carnivora. The only previous experiments on herbivora were made on a goat by Lehmann, who found the juice had no digestive action. The present experiments, by Fritz Pregl were made on a lamb. The juice was collected by a modification of the Thiry-Vella method, from 3 to 5 grams of juice being obtained from the loop per hour. It is a mucous, strongly alkaline fluid, which is rich in proteid, and tends, like pancreatic juice, to set into a jelly spontaneously; its specific gravity is about 1.014. It contains about 0.2 per cent. of urea. The following analysis is given in parts per 1000.

Sodium carbonate	3.69
Albumen and globulin	18.09
Albumoses and mucin	1.27
Urea	2.29
Other organic substances	3.31
Ash	1.27
Water	970.05

On proteids, cellulose, pentoses and fats, it has no digestive action, but it converts starch and glycogen into dextrose with intermediate dextrins; it inverts cane sugar and maltose, but not lactose.

[J. C. S., 70^{II}, p. 49; from Pflüger's Archiv., 61, p. 359.]

Action of Mustard and Pepper on Disgestion.

According to Gottlieb, observations of the constant and regular secretion of the pancreatic juice, by means of a canula in the pancreatic duct of a rabbit. showed that the introduction of mustard or pepper into the stomach caused the secretion to be three or four times as large; the juice was somewhat abnormally watery, but possessed the same digestive properties.

[J. C. S., Vol. 70 , p. 42; from Exp. Stat. Record, 7, p. 48; from Verhandl. Natur. Med. Ver., Heidelberg, 5.]

Lactase of the Small Intestine.

Franz Röhmann and J. Lappe have investigated the action of the small intestines of calves, oxen and young and old dogs, on solutions of milk sugar. The intestines were also extracted with chloroform, with thymol solution, and with sodium fluoride solution, and the action of these extracts on the milk sugar studied. In all cases, with the exception of ox intestine, after digestion for several hours, dextrose could be identified in the solution by means of its osazone. Alcohol precipitates from the above extracts of the intestine a substance which will also hydrolyse milk sugar.

Quantitative experiments as to the amount of dextrose formed were also made.

[Ber., 28, p. 2506.]

Scientific Societies.

Recognition of Pharmacy by the Academy.

The *Académie des Sciences* has awarded the *Prix Jecker* to M. Tanret, a French pharmacist in Paris, with the sum of 6000 francs from the fund attached to the prize, and the title of *Lauréat de l'Institut.* Tanret is best known to pharmaceutical students for the successful isolation of constituents of drugs, e. g. ergotinine, pelletierine, heperidin etc.

At the occasion of the hundreth anniversary of the French Institute, M. Moissan, professor of toxicology at the *École de Pharmacie de Paris*, and member of the French Academie of Sciences and of the Academy of Medicine, was promoted to the position of officer of the Legion of Honor.

Universities and Colleges.

Attendance at German Universities.

The number of students attending German universities during the last semester was 29,117 against 29,107 last summer and 28,158 a year ago. Of these 870 are pharmaceutical students against 883 last winter. Of the entire number 2,287 were foreigners, the greatest number on record.

It may not be amiss to call attention to the fact that in 1885 the German empire had a population of almost 47 millions, and that every prospective pharmacist must attend some university for four semesters, the greater part of the last semester being given up to examinations.

Monument for Professor Endlicher.

The academic senate of the University of Vienna has permitted the erection of a monument in the arcades of the university in honor of the well-known botanist, Dr. S. L. Endlicher, formerly professor of botany and director of the botanical garden.

Jurjew.

The elimination of the German element from the University of Dorpat, now Jurjew, apparently is not being attended with very happy results. Both the successor of Prof. Dragendorff and the dean of the medical faculty have had serious encounters with the students. If the reports of anarchy which are circulated are true the situation is certainly very deplorable.

Another Seventieth Anniversary.

Prof. Conizzaro, the famous Italian chemist, will celebrate his seventieth birthday on July 12th of this year. Italian chemists are actively making preparations for a fitting celebration of the day.

Literary.

Books and Pamphlets Received.

Vandenhoeck und Ruprecht—Göttingen. Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. Heinrich Beckurts, o. Professor an der techn. Hochschule zu Braunschweig. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang.) Ein Bd., pp. VI, 894. 1895. M. 22.00.

Jahresbericht über die Fortschritte in der Untersuchung der Nahrungs- und Genussmittel. Bearbeitet von Dr. H. Beckurts. Sonderabdruck aus dem Jahresbericht der Pharmacie. 4. Jahrgang 1894. Ein Bd., pp. 197. 1895. M. 5.60.

Lea Brothers & Co.—Philadelphia. The Year-Book of Treatment for 1896. A critical review for practitioners of medicine and surgery. One vol., 12 mo., pp. 484. 1896. Cloth $1.50.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenshaften. Herausgegeben von Prof. Dr. Otto Lueger, Civil-Ingenieur in Stuttgart, im Verein mit Fachgenossen. Mit zahlreichen Abbildungen.

X. Abtheilung (Schluss des zweiten Bandes). Brautthuer—Calcium karbonat. pp. 641—800. 1895. M. 5.00.

XI. Abtheilung. Calcium oxyd—Dampfkessel. pp. 1—160. 1895. M. 5.00.

Verlag der H. Laupp'schen Buchhandlung—Tübingen. Einleitung in das Studium der Chemie. Von Dr. Ira Remsen, Professor der Chemie an der Johns Hopkins Universität in Baltimore. Autorisirte deutsche Ausgabe. Bearbeitet von Dr. Karl Seubert, a. o. Professor der Chemie an der Universität Tübingen. Zweite Auflage. Ein Bd., pp. XVI, 474. 1895. M. 6.00.

—Kurze Anleitung zur Massanalyse. Mit spezieller Berücksichtigung der Vorschriften des Arzneibuches. Bearbeitet von Dr. Luwig Medicus, a. o. Professor an der Universität Würzburg. Fünfte und sechste Auflage. Ein Bd., pp. X, 158. 1895. M. 2.40.

Verlag von Leopold Voss—Hamburg. Anleitung zur Microchemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der Polytechnischen Schule zu Delft.

Erstes Heft. (Anthracengruppe, Phenole, Chinone, Ketone, Aldehyde.) Mit 49 Figuren im Text. pp. VIII, 64. 1895. M. 2.00.

Zweites Heft. (Die wichtigsten Faserstoffe.) Mit 18 Figuren im Text und drei Tafeln im Farbendruck. pp. VIII, 108. 1896. M. 5.00.

Julius Springer—Berlin. Neues Pharmaceutishes Manual. Von Eugen Dieterich. Mit in den Text gedruckten Holzschnitten. Nachtrag zur sechsten Auflage. Ein Bd., pp. 72. 1896. M. 2.00.

J. B. Baillière et Fils—Paris. Formulaire des Médicaments Nouveaux pour 1896. Par H. Bocquillon-Limousin, pharmacien de 1re classe. Avec une introduction par Henri Huchard, Médécin de l'Hopital Necker. 7e édition, revue, corrigée et augmentée. 1 vol. in—18, pp. VIII, 306. 1896. Cartonné 3 fr.

J. J. Heines Verlag—Berlin. Wie leitet man eine Versammlung? Geschäftlicher Handweiser für Vorsitzende. Von einem Mitgliede des deutschen Reichstages und des preussischen Abgeordnetenhauses. Ein Bd., pp. 88. M. 1.00.

Author—Brooklyn. An Ephemeris of Materia Medica, Pharmacy, Therapeutics and Collateral Information. January 1896. By Edward R. Squibb, M. D., Edward H. Squibb, S. B., M. D., Charles F. Squibb, A. B. Vol. IV. No. 4, pp. 1678—1757.

Burroughs, Welcome & Co.—London. Chemists Vest Pocket Diary and Ready Reference. pp. 155. 1896.

Author—Ann Arbor. The Chemical Laboratories of Germany. By Prof. A. B. Prescott. Pamphlet, pp. 14.

Proceedings of the Ohio State Pharmaceutical Association at its seventeeth annual meeting held in Sandusky, June 4, 5 and 6, 1895, together with the constitution, by-laws, pharmacy law, adulteration law, poison law, label law and morphine law, also list of members. One vol., pp. 108. 1895.

Reviews.

Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. Heinrich Beckurts, o. Prof. an d. techn. Hochschule in Braunschweig. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang). Vandenhoeck und Ruprecht, Göttingen, 1895. M. 22.00.

At the beginning of this century it was possible for a single person to accomplish remarkable results in more than one science. Likewise it was possible for one person to record annually the progress made not only in one but in several sciences. Since then conditions have changed materially. The physicist finds it wellnigh impossible to keep abreast with the progress of a closely related science, chemistry. He seldom if ever claims to keep posted on the progress made by botany or zoology. This is equally true of the chemist and of other scientists.

It is no doubt true that the man of science in one department does not remain totally ignorant of the progress made in other departments. Even the public at large becomes aquainted with remarkable discoveries of a more or less popular character. The educated scientist may even keep up a reading knowledge of the progress made in other departments and may be able to converse intelligently about recent discoveries in other branches of science.

The truly educated man, however, no matter how well read he may be outside of his particular domain, will be very cautious when he leaves his own territory of research and study. Knowing only too well from the mistakes made by others in writing about the chapter of science in which he is master, he is aware that the lack of a full knowledge of essential details might lead him astray when venturing critically into the fields cultivated by others.

This may be construed as a sad confession of the modern scientist, who has sacrificed breadth for the sake of depth of knowledge. Such an explanation of modern conditions would be as superficial as unjust. It is true an Alexander von Humboldt would be impossible to-day, but it is equally true that many a scientist of to-day has a better conception of the universe than the writer of the cosmos. Depth of true specialization is possible only on a broad foundation and constantly broadens the mental horizon. The botanist of to-day who studies the histology and micro-chemistry of a single section must have a better knowledge of physics and chemistry in order to interpret correctly what he sees, than the botanist of the good old times who had stored away in his memory the names of all plants known in his day and who possessed a similar stock of information in the other sciences of his generation.

To write abstracts of scientific articles and to catalogue them is doing to-day practically what the old herbalist did in former generations. A thorough, though elementary course in biology will give the student a better understanding of life, both vegetable and animal, than a lifetime spent in collecting, drying and labeling plants.

The person who desires to be informed to-day with regard to the progress made by any particular science, or branch of any science, does not want to plod his way through a host of abstracts no matter how accurately and systematically they may be arranged. Ten pages of more general information written by a person who is a master of the field, will be worth more to him than a hundred pages of disconnected details. This should not be construed to imply that there is no use for a most comprehensive catalogue of detailed information.

Pharmacists who are interested in the progress of the pharmaceutical sciences, however, are less interested in details than in general outlines of progress. The pharmaceutical sciences are too numerous to enable one man to grasp or digest all the details. Yet the intelligent practicing pharmacist, on account of the varied branchings of his science is possibly more in need of annual reports on the various sciences than any other person. The pharmaceutical specialist will be equally eager for such information, though he will also welcome the detailed catalogue of all important articles published during the year.

It may not be practicable, it may not even be wise to write separate reports for both classes. However, the greater need, the spreading of that general information of progress, should not be sacrificed for the sake of a more detailed catalogue.

It does not seem possible for any particular person to abstract intelligently the more important scientific publications of the year that appear in the various departments of science. Still less will it be possible for one person to present a birdseye view of the annual progress in these various departments.

An ideal report on the progress of pharmacy cannot be expected. Better reports, however, should be possible if the efforts of more scientists were united in the writing of such a report. Of the three annual reports, that of the German Apothecaries Society is not only the oldest, but also the most complete. The Jahresbericht, however, does not pretend to be anything more than a catalogue of abstracts. The complaint of the publishers that so few pharmacists purchase the Jahresbericht although it is annually recommended by the "entire professional press", no doubt finds its explanation in this fact. The busy pharmacist has no time to read all the detailed information about alkaloids, volatile oils, sugars and the like. He wants to know in a general way what progress is being made in these directions, but the information that he desires will not consist of a host of details boiled down to catalogued abstracts but will be best contained in an essay on these subjects. Such essays would be equally sought by the specialist in other departments of the same science. The specialist will also welcome the catalogued facts. It must not be supposed, however, that a series of abstracts no matter how good, can or will replace the original articles. The Jahresbericht will always remain a valuable adjunct to a series of the best journals, but in the library of the University or of the specialist it can never replace them. *E. K.*

Dictionnaire de Physiologie par Charles Richet, Profésseur de Physiologie à la Faculté de Médicine de Paris. Tome Premier, A—B, avec gravures dans le texte. Fascicule 2^{e} pp. 337—672. Ancienne Librairie Germer Ballière et Cie, Paris; Felix Alcan, Éditeur, 1895. 8 fr. 50 centimes.

The second fascicle contains 66 articles: from *aliments* (cont.) to *Aristote*. The last two articles viz. *Argon* and *Aristòte* indicate in a striking manner the wide scope of the work not only with regard to subject matter but also as to time. The first communication with regard to argon by Lord Rayleigh and Prof. Ramsay to the British Association was made in Aug. 1894. The last observation recorded in the Dictionnaire is that by Berthelot made known April 16th 1895.

The thinking chemist will no doubt ask of what significance can the inert argon be in physiology? Prof. Richet indeed has but a short paragraph on the physiology of the subject. He states: "We are not able to foresee the consequences of this recent discovery on the theory of respiration. The fact that the solubility of argon is greater than that of nitrogen, permits us solely to suppose that the blood ought to dissolve a certain quantity of argon. If it is assumed that the blood dissolves 2.4 parts of so-called nitrogen it follows that there ought to be about 0.4 parts of argon to 100 parts of blood (?)."

The article *Aristote* on the other hand furnishes 5½ pages of historical information, which will interest not only the physiological specialist but the general reader as well. The authors are evidently thoroughly embued with the historic spirit. Prof. Richet who has also written this article concludes the subject with the following paragraph, which manifests the spirit in which it was written.

"These quotations may suffice to judge the work of the master. He may truly be called master, who during eighteen centuries reigned in science without compeer. But, however grand he may be, it is well that he was dethroned. Nature is richer than the works of even the greatest man; and when Harvey tried to demonstrate some of the most important laws of physiology he was unfortunately opposed by the teachings of Aristotle. In the search for truth which we pursue with ardor, our predecessors ought not to prove themselves an obstacle but a support."

A very timely article is that on antitoxines, which developes historically and discusses the various phases of the subject under a number of headings, viz: Theories of immunity and addition, doctrine of vaccination, discovery of antitoxic elements, mechanism of antitoxic effects, hereditary transmission of antitoxic attributes, serum therapy, etc.

Other articles that are of interest to any scientific reader are those on antisepsis and asepsis, with an interesting historical chapter; antiseptics, with tables of comparative value; anæsthetics, general and local, with several pages of bibliography for the specialist; carbohydrates; altitudes, with tables of altitudes of health resorts, principal cities, and mountains arranged geographically; and anthropology.

Chemical elements receiving special consideration together with their compounds are aluminium, antimony, silver. Organic chemicals deserving special attention are aniline, antipyrine, apocodeine, apomorphine, arabinose, amylnitrite. Articles of special interest to zoologists, are those on amoebae and spiders (*Arachnides.*) *E. K.*

Anleitung zur mikrochemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der polytechnischen Schule zu Delft. Heft II. pp. 108. Mit drei Tafeln in Farbendruck. Leopold Voss, Hamburg and Leipzig. 1896. M. 5.00.

The work of which this is the second part, seems to be a departure in a new directon, one which is likely to yield good returns. In this second installment of his work, the author, already well and favorable known among users of the microscope by reason of his helpful works bearing on the technique and method of microscopic investigation in botany, is again dealing in the main with plant subjects; it seeming rather a work of histology than of chemistry as we ordinarily think of it. He here takes up the microscopic study of the different fibres made use of in the industries.

In the first section of the work, a description of the most important fibres as they ordinarily appear under the microscope is given, both of those used in spun fabrics and in paper making. Their conduct under polarized light is described and some space is devoted to the action of the various reagents that swell and dissolve them as well as the color reactions following treatment with the various staining media.

In the second section, the spun fibres are grouped according to their conduct toward stains and polarized light, a sort of analytical key resulting. The special reactions of the various kinds of fibre then follow in considerable detail.

The third section is devoted to the investigation of papers and their constituent fibres. The ash residue, and the finishing materials, as sizing and coloring agents, receive attention. A scheme for identification similar to that in the second part renders it possible to conveniently place any of the various fibres used. By means of three colored plates, the effect of stains is illustrated.

In this little work, we see the apparently impractical scientific basis supporting an exceedingly practical structure, granting that things industrial are things practical. To those interested in fibres from either the economic or the scientific standpoint, this will doubtless be a welcome contribution. *R. H. True.*

Commentar zum Arzneibuch für das Deutsche Reich. Herausgegeben von H. Hager, B. Fischer und C. Hartwich. Zweite Auflage. Mit zahlreichen Textabbildungen. In zwei Bänden. Verlag von Julius Springer, Berlin.

This comprehensive commentary on the Pharmacopœia of the German Empire has met with such deserved success that a second revised and enlarged edition could be issued in a comparatively brief time after the appearance of the first edition. This and the first volume of the new issue have been reviewed in these pages. Upon the appearance of the last volume, the excellent work calls for no further commendation than to call anew the attention to its completion and its usefulness for pharmacopœial study. Paper, print and illustrations are excellent. *Fr. H.*

Neues Pharmaceutisches Manual. Nachtrag zur sechsten Auflage. Von Eugen Dieterich. Ein Band, p. 73. Verlag von Julius Springer in Berlin, 1896. M. 2.00.

The sixth edition of Dieterich's Pharmaceutisches Manual, to which this book is a supplement, was reviewed in the Pharm. Rundschau, 1894, p. 223. Instead of publishing a new edition, the author has thought it best to embody the necessary changes and additions in a small, separate volume, and thus save the increased cost of a large book. That the public will be better satisfied with this plan there can be no doubt, as the buying of separate editions of costly books, differing but slightly from one another, is a considerable burden to most people.

Most of the first half of the small book is taken up with corrections of and additions to the formulas in the original volume. The introductions to several of the chapters, e. g., that on extracts, have been almost entirely rewritten and brought up to date. Pharmaceutical technique has not been neglected, and we find excellent descriptions and illustrations of some of the latest devices of use to the pharmacist. The latter half of the volume is a new departure: an alphabetical list of substances mentioned and technical expressions used in this and the original volume, together with their Latin, French and English translations. This is especially intended to facilitate the use of the book for readers unfamiliar with German, but it is too incomplete by far to serve this purpose.

A number of very simple words as, *und*, *gelb*, *sauer*, *braun*, etc., have found their way into the list, while many technical expressions used frequently in Dieterich's Manual and which cannot be found except in the larger dictionaries, are omitted. It would also have been well for the author to have entrusted the compilation of the translations to a person or persons familiar with the respective languages. This would have avoided such translations as the following: *Gaze*—gas (for gauze); *niederschlagend*—temperens (for precipitating); *Rosenhonig*—melrose (for honey of rose); *Sardelle*—sardel (for sardines); *bestimmt*—determinate (for determined); *Watte*—wad (for cotton); etc. Besides dozens of similar translations, the English part is full of typographical errors that are inexcusable in a work of this kind.

The paper, print and binding of the book are excellent, and a credit to the publishers.

R. Fischer.

Lehrbuch der praktischen Photographie. Von Dr. Adolf Miethe. Verlag von Wilhelm Knapp. Halle. pp. 440. Mit 170 Illustrationen. 1896.

This book, as the title indicates, is a text-book of photography, intended especially for the use of practical photographers. It contains, however, much of value to amateurs who wish to make photography a study as well as pastime.

The author begins, in true German fashion, at the bottom, treating briefly those properties of light which determine the formation of the image, discussing the different errors of lenses and explaining clearly the method employed by the lens-maker in correcting them. The following chapters give minute directions for testing lenses and some excellent advise on the choice of objectives for the particular use for which they are intended. The remainder of the book is devoted to: The Chemistry of Photography; Photographic Apparatus; Negative and Positive Processes; Reproduction and Enlarging; Orthochromatic Photography; and finally to Photographic Aesthetics. The author shows himself throughout a master of his subject, with more than the usual faculty for putting scientific facts in simple yet accurate language.

C. B. Thwing.

Jahresbericht über die Fortschritte in der Untersuchung der Nahrungs- und Genussmittel. Bearbeitet von Dr. H. Beckurts, o. Professor an der Herzogl. techn. Hochschule in Braunschweig. Sonderabdruck a. d. Jahresbericht der Pharmacie. 4. Jahrgang, 1894. Vandenhoeck und Ruprecht, Göttingen. 1895. M. 5.60.

In accordance with the idea that the peculiar training of the pharmacist should fit him for the work of a general analytical and sanitary chemist, the *Jahresbericht für Pharmacie* has for a number of years given a liberal amount of space to the subject of food stuffs, also a number of pages to toxicological chemistry. Inasmuch as the offices of apothecary and food chemist or forensic chemist are as a rule not held by one person, the publishers of the *Jahresbericht für Pharmacie* have considered it advisable to issue parts IV (*Chemie der Nahrungs- und Genussmittel*) and V (*Toxicologische Chemie*) as a separate volume under the title of *Jahresbericht der Nahrungs- und Genussmittel*. The volume before us is the fourth of this kind and contains a classified catalogue of abstracts of articles and references to books published in 1894.

What has been stated in a general way with regard to the need of more general annual reports of progress in connection with the *Jahresbericht für Pharmacie* does not apply with equal force to this part of the work. However desirable and instructive a more general report on the subject of food stuffs might be made, the food chemist largely wants to know about details of analytical processes, about the standards of various countries, etc.

The articles receiving special treatment are those usually discussed in similar works, viz.: milk, cheese, butter, fats and oils, wax, meat and meat preparations, flour, bread, etc. A chapter that will appeal to the pharmacist, though he may not be interested in the chemistry and adulteration of food stuffs, is that on secret remedies. Analyses of a number of such secret nostrums are recorded. A chapter of equal interest to pharmacists and analytical chemists is that on toxicological chemistry. For ready reference the book is provided with a detailed index.

E. K.

Kurze Anleitung zur Massanalyse mit spezieller Berücksichtigung der Vorschriften des Arzneibuches. Bearbeitet von Dr. Ludwig Medicus, a. o. Professor an der Universität Würzburg. Fünfte und sechste Auflage. Verlag der H. Laupp'schen Buchhandlung, Tübingen, 1895. M. 6.00.

Whereas the later editions of the United States Pharmacopœia have many of the aspects of a text-book, the German Pharmacopœia, or *Arzneibuch* as it is now called, has more the character of a briefly descriptive catalogue. As a result text-books leading the student to an understanding of the ofttimes meagre descriptions of the pharmacopœia are by no means scarce.

The brief introduction to volumetric analysis by Prof. Medicus, which has already gone through four editions and which has again been printed in a double edition will be found serviceable as a guide to students beginning the study of volumetric analysis. The book is of a sufficiently elementary character and free from confusing details, so that any student with an elementary knowledge of chemistry can readily comprehend the text. In fact, details have apparently been studiously avoided. Thus e. g. under the heading of burettes only two are mentioned, viz: Mohr's with a pinch-cock and Gay Lussac's burette. In this country the latter is found oftener in the cabinet and used for lecture demonstration than for actual use in the laboratory, Mohr's burette with a glass stop-cock being almost universally employed when rubber must be avoided. But when not carried too far, as in this instance, simplicity and absence of unnecessary details in an elementary text-book are an advantage. Although the author does not at all restrict himself to the German Pharmacopœia, the book is written with special reference to the needs of pharmaceutical students. The student who has used this book as an introduction to volumetric analysis certainly should find no difficulty in using as a reference book any of the larger and more comprehensive treatises, in the application of volumetric methods to his everyday analytical needs.

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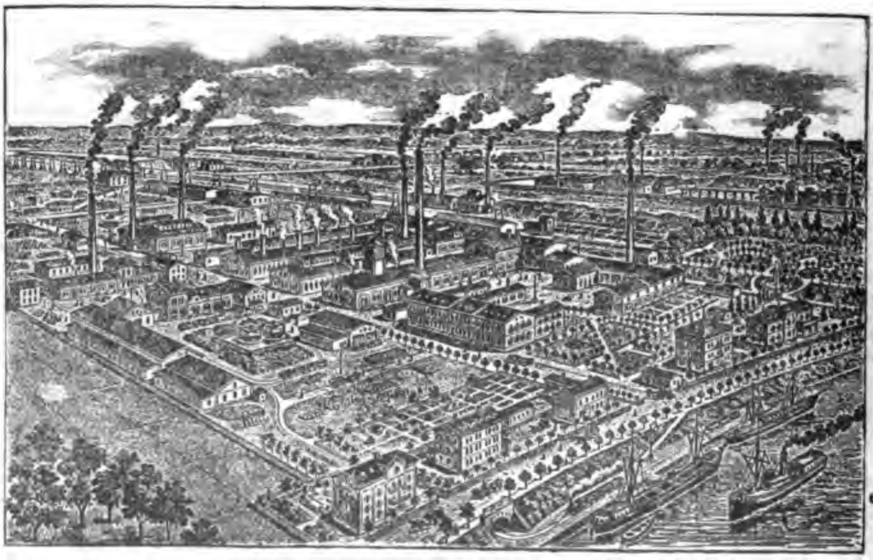

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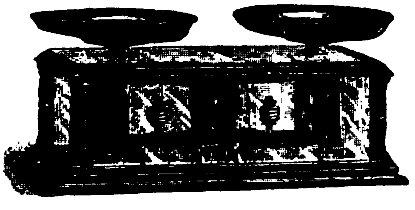

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 4. **APRIL, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 4. **APRIL, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

The Berlin Industrial Exhibition of 1896.

Among the several events in commemoration of the 25th anniversary of Berlin as national capital of the German empire, the municipal authorities jointly with the commercial, industrial and professional branches have decided upon an industrial exhibition on a grand and national scale, which will be open from May 1 to October 15, 1896, in one of the beautiful parks on the banks of the river Spree, in the northern part of the great metropolis. This enterprise has met with the favor and support of the national government and the German people in general and is in prompt progress toward completion.

The main object of this exhibition is to present a complete picture of the achievements of the industries and arts of Berlin, to demonstrate their magnitude and progressive character as well as their importance in the national life of Germany and the commerce of the world. Special attention will be devoted to those branches of industries and arts which have prospered for a long time in Berlin and gained a world-wide reputation. In connection with them a vast number of masterpieces of former centuries will be exhibited, and the emperor of Germany has consented to loan many treasures of industrial art in his possession, and in that of the Royal Museums. The city authorities of Berlin have erected a magnificent pavillion, in which a detailed representation of the famous institutions of the municipal administration will be on exhibition, including canalisation, public health and charities, etc. In addition to these exhibits such departments as public education, trade-schools, sanitary institutions and matters, prevention of accidents, horticulture etc. will be amply represented.

The German colonial exhibition will also form a comprehensive and instructive display, especially of African products, and will be of general interest and importance.

The exhibition grounds in the Treptow Park have a greater area than those of most international exhibitions hitherto held in Europe, and offer particular advantages by their close proximity to the city and their picturesque beauty. They comprise with the adjacent territory an area of about one million square meters, and are mostly covered with beautiful, well-cultivated groves, lawns and plots of flower-beds, reflected with their verdure and floral splendor in the waters of the broad river that flows past them.

The main building (illustration, 1) covers an area of 53,000 square meters. Other great structures of similar magnitude are the buildings for chemistry, physics, physical, mathematical and other instruments, and of photography, including lecture halls for public demonstrations; the fishery building, the halls for food products, for machinery, for engineering, for electricity, the exhibition-buildings of the municipality of Berlin and hundreds of minor buildings, all of great architectural variety and beauty.

Two of the great side-shows of the grand exhibition will be "Old Berlin" and the "Streets of Cairo". The former will be a faithful and most artistic reproduction of parts of the old capital. This wonderful construction of the ancient city of the Margraves will present in every way a correct reproduction of Berlin in those days, long passed, when the people of the Mark Brandenburg were the strong guardians of the extreme outposts of German life. "Cairo", far surpassing in magnitude and beauty the rather primitive representation of a street of Cairo in Midway Plaisance at the Chicago Fair, is mainly destined as a market-place for the great industrial activity and art-reproduction of Berlin. Here German art of imitative decoration is to demonstrate what perfection it has obtained in copying from nature as well as from artistic models of all ages.

The exhibition comprises the following 23 groups:

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2. Clothing industries;
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16. Paper manufacture and industries;
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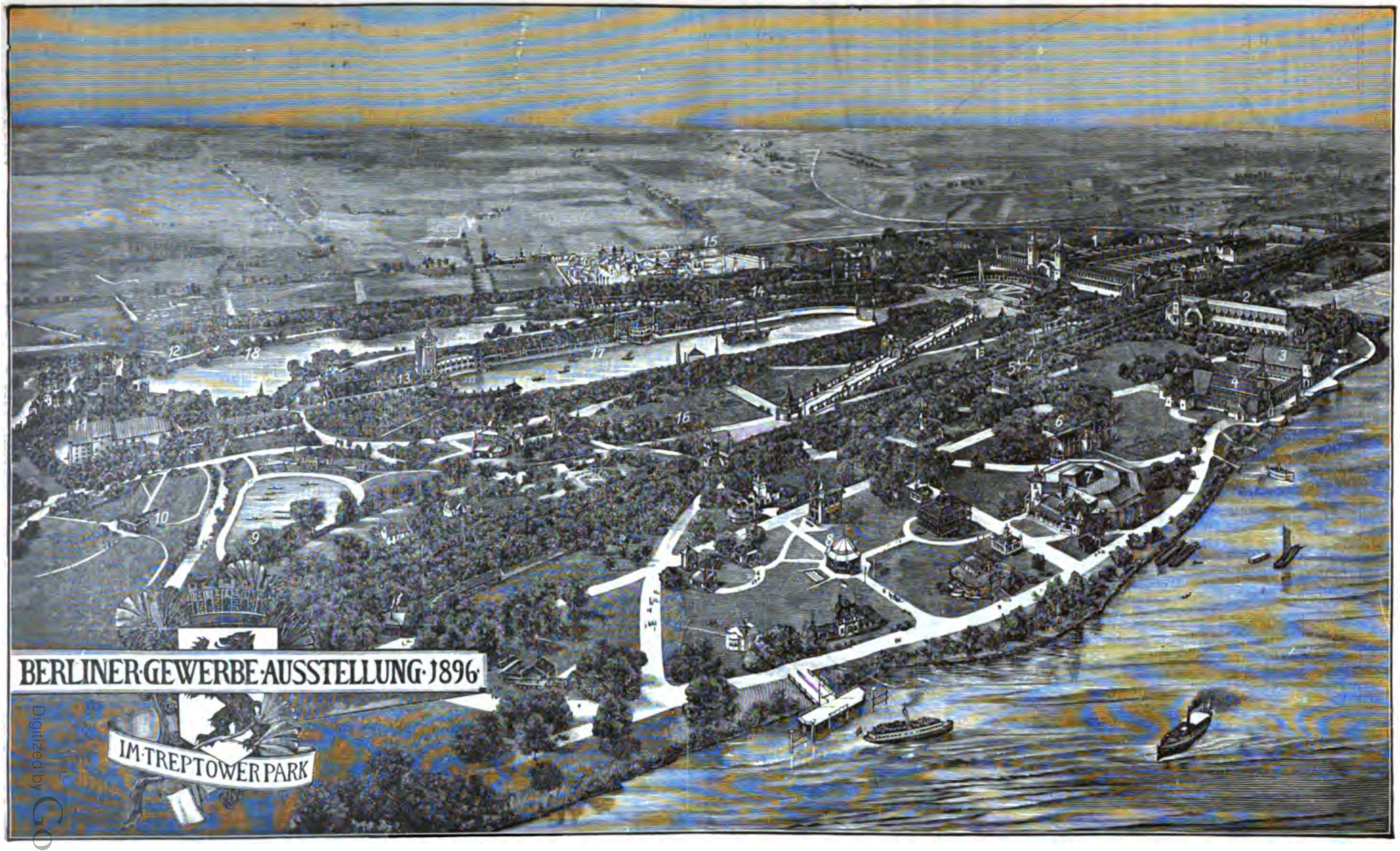
19. Education and educational institutions and methods;
20. Fisheries, boating and kindred sport;
21. Driving, horsemanship, water sports, cycling and aeronautics;
22. Horticulture;
23. German colonial exhibition.

The birds-eye view of the greater part of the exhibition grounds and buildings on page 75 will, better than any detailed description, give a general and correct idea of the extent and the grandeur of the Berlin exhibition. Contrary to American custom, the exhibition buildings will be kept open till a late hour at night, and will be brilliantly illuminated by electric light. The grounds of the exhibition and all the restaurants and side-shows will remain open until midnight, and amusement and entertainment for the visitors in the best of taste and of the most varied kind and perfection will be provided.

Comparisons of the various great exhibitions of recent years are rather out of place and mostly misleading. After the magnificent World's Fair in Chicago, however, Americans are justified, when making such comparisons, in choosing a rather lofty standard for subsequent national or international exhibitions. American readers of the *Review* and American visitors to the coming Berlin exhibition who may still be under the overwhelming impression of the magnitude and immensity of the unsurpassed fair of the "White City" may, however, be assured that a visit to the Berlin industrial exhibition will be in no way a disappointment. The completion of the fair-grounds and buildings, of the access by land and water from all parts of the great metropolis, is in full progress, and gives even now in the changeable days of the mild German spring weather the impression of a national enterprise on a magnificent scale. They will certainly compare advantageously in natural scenery and in architectural, ornamental and floral beauty with the large area and structure of the "White City". Upon a close survey of the grounds and buildings at the Treptow Park the writer can assure his American readers and friends that whoever contemplates and can afford to make an European trip during the coming summer, should not fail to make Berlin the foremost object of a prolonged stay. No one will ever regret this visit, but will, no doubt, take home enduring impressions of delight received in this wonderful modern centre of the highest types of arts, sciences, industries, trades and commerce, as well as of a great metropolis famous by its model municipal administration.

Berlin, March 1, 1896. *Fr. H.*



Birdseye view of the Berlin Industrial Exhibition in the Treptow Park.

1. Mainbuilding. 2. Chemical industries, chemical, physical and surgical instruments and apparatus. 3. Foods. 4. Fisheries and sports. 5. Exhibits of the administration of Berlin. 6. Water- and gas supplies. 7. Great Alpine panorama. 8. Restaurants. 9. Marine displays. 10. Giant telescope. 11. Old Berlin. 12. German colonial exhibition. 13. Main Restaurant. 14. Educational and benevolent institutions. 15. Cairo. 16. Horticulture. 17 and 18. Lakes.

ORIGINAL CONTRIBUTIONS.

The Quantitative Estimation of Carvone in Volatile Oils.

By *Edward Kremers* and *O. L. Schreiner.*

(Report of the *Research Committee* C, U. S. P. Revision.)

Occurence of carvone.

Carvone has thus far been proven to exist as a natural constituent in only five oils. Dextrogyrate carvone occurs in caraway oil[1] (*Carum carvi*) and dill oil[2] (*Anethum graveolens*). Laevogyrate carvone occurs in spearmint oil[3] (*Mentha viridis*), in the allied *Krauseminz oel*[4] (*Mentha crispa*) and in kuromoji oil[5] (*Lindera sericea*).

Methods of quantitative estimation.

The quantity of carvone in these oils has been determined by different methods each of which appears to give different results. The literature on the carvone content of these oils is therefore rather unsatisfactory. The methods that have been devised and used at different times are the following:

I. By fractional distillation.[6]

A fraction boiling within several degrees on either side of the boiling point of carvone is collected and weighed as such.

II. By means of the crystalline hydrogen sulphide addition product.[7]

To a fraction of sufficient range in boiling point and supposed to contain all of the carvone, is added one-fourth its volume of alcohol and a few drops of ammonia water. By passing hydrogen sulphide through this mixture the crystalline carvone hydrosulphide is precipitated, and may be weighed as such, or the carvone may be again liberated by saponification with alcoholic potash and then weighed.

III. By Hübl's iodine absorbtion method.[8]

The iodine factor of pure carvone is stated to be 103—110; that of limonene, with which carvone is associated in caraway oil, is much greater. A large iodine factor would therefore indicate a large percentage of limonene, i. e., a poor oil.

IV. By means of specific gravity.[9]

The specific gravity of carvone and of limonene are known, that of the former being greater than that of the latter. From the specific gravity of a mixture of the two, such as the volatile oil is supposed to represent, the ratio of mixture can be calculated.

V. By means of phenyl hydrazine.[10]

The oil is warmed with a weighed quantity of phenyl hydrazine and then filtered from the insoluble phenyl hydrazine condensation product of carvone. The unchanged phenyl hydrazine in the filtrate is oxidized by means of Fehling's solution, whereby the nitrogen is liberated as such and collected. From the volume of nitrogen the quantity of phenyl hydrazine in the filtrate may be calculated. The difference between this and the original quantity gives the amount of phenyl hydrazine which has combined with the carvone, and from this the amount of carvone can be readily calculated.

VI. By means of the rotatory power.

The rotatory power of these oils has also been taken advantage of in determining their purity or strength. The rotatory power of limonene is much greater than that of carvone.

Criticism of these methods.

I. Those familiar with the behavior of complex natural mixtures of substances such as the volatile oils almost always are, upon distillation, will know that only approximate results can be obtained by this method, even by working with comparatively large quantities. The oils containing carvone readily undergo changes upon distillation, leaving a very dark-colored residue, sometimes considerable in quantity. This cannot be entirely obviated even by distillation under greatly reduced pressure. Furthermore, whereas carvone is volatile with limonene vapor, some of the limonene is retained by the carvone. Complete separation is therefore only possible by repeated fractional distillation, but as already mentioned, decomposition takes place every time the carvone is distilled, so that there is considerable loss by the formation of dark residues. Wherever a sufficient amount of oil is at the disposal of the analyst and only approximate valuation is desired, this method has the advantage of simplicity.

II. This method is in so far superior to the first that it allows of the separation of the carvone in the form of a crystalline derivative. In addition to the length of time required, this method has several drawbacks: 1.) The precipitation of carvone as hydrosulphide is not quantitative. 2.) Some of the carvone is converted into thiocarvone and thiocarvone hydrosulphide.[4]

III. The objections that might be brought against the iodine absorbtion method are so numerous and so evident to anyone familiar with terpene literature that their discussion may be regarded as superfluous. The method as it is applied in general is utterly unscientific. As to its application to any of the carvone-containing oils, it may suffice to state that no one has ever studied the chemistry of the process.

IV. In regard to the fourth method attention must be called to the fact that the oils containing carvone do not consist simply of carvone and limonene, although other constituents have not been definitely isolated or identified. Furthermore, limonene, a constituent of several of the carvone-containing oils, polymerises and resinifies to a marked extent. A sample of limonene from erigeron oil that after repeated fractionation had been collected within the limit of a half degree in this laboratory about two years ago was again subjected to an examination. It was decidedly resinous in odor and appearance and was therefore purified by distillation with water vapor. About 30% of the total quantity was not volatile and was heavier than water. The distillate, when subjected to fractional distillation, boiled everywhere from 165° to 185°. This clearly shows that marked changes had taken place in the limonene, and it also shows that the specific gravity of a poor oil may increase on exposure to the air until it shows the specific gravity of a better oil. That the specific gravity is not always a criterion of purity or strength is also shown by the result of the examination of several commercial samples of caraway oil. As will be seen later, one oil in particular answered to the specific gravity and alcohol solubility tests of the U. S. P. and yet turned out to be a most worthless, although somewhat skillfully adulterated product.

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[1] Völckel, Annalen, 35, p. 308; Ibid., 85, p. 246. Gladstone, Chem. News, 24, p. 283.

[2] Jahresbericht der Chemie, 1863, p. 545.

[3] Ibidem, 1863, p. 545.

[4] Beyer, Archiv d. Pharm., 1883, p. 283.

[5] Chem. Zeit., 14, 1890, p. 1675; Arch. d. Pharm., 230, p. 285.

[6] Arch. d. Pharm., 1874, p. 324.

[7] Beyer, Arch. d. Pharm., 1883, p. 283.

[8] Jahresbericht d. Pharm., 1889, p. 363.

[9] Chem. Zeit., 1889 p. 1704. Proc. A. Ph. A., 1890, p. 587.

[10] Monatshefte f. Chemie, 1893, p. 270.

The angle of rotation of polarized light of these oils is even more unsatisfactory than the specific gravity. It has been repeatedly noticed in this laboratory that limonene is not constant in rotatory power. When freshly prepared its specific rotatory power is about 120°, but this gradually diminishes as it grows older, whereas the specific gravity increases at the same time. Some solvents also have an appreciable effect upon the rotatory power of limonene.*

V. This method is claimed to be applicable to both ketone and aldehyde constituents of volatile oils. It has been used with asserted good results in the estimation of bitter almond oil, cumin oil, and Spanish oil of rue.[10] Less satisfactory results were obtained in the estimation of the oils of cassia, caraway, fennel and lemon. The carvone content of the examined caraway oils (31.5%; 35.9%; 39.3%) is certainly too low for a good caraway oil which should contain about 45—50% of carvone. Aside from these facts the method presents some disadvantages in manipulation.

Of the five methods briefly reviewed two are based on physical constants, which, as has been shown, are not constant, because the substances of which they are characteristic undergo changes. Two are based on chemical reactions. One of these is not sufficiently quantitative to admit of accurate work, the other does not even obtain the endorsement of its advocates when it comes to the application of the general method to carvone-containing oils. Lastly, one of the methods is wholly unscientific, being based on reactions not at all clearly understood. A specific gravity determination; a determination of rotatory power; a test of solubility in alcohol, etc., are usually considered sufficient and are not without value particularly as preliminary tests. Although one or the other, or even several taken together may be misleading it is not probable that a poor or adulterated oil will satisfy all of these tests.

As a necessary consequence of the unreliability of the methods reviewed the information concerning the amount of carvone in volatile oils is on the whole unsatisfactory.

In 1874 R. Nietzki,[11] who made a chemical examination of dill oil, upon fractional distillation, obtained 30% of carvone, boiling between 225 and 230°.

Geissler[14] (1883) states that pure caraway oil contains 60 to 65% carvone and 30 to 35% "carvene".

A. Beyer[12] (1883) calls attention to the fact that German *Krauseminzöl* contains more carvone than American spearmint oil. "Wie Flückiges fand, gab von Schimmel & Co. dargestelltes roher deutsches Krauseminzöl, welches bei 50 mm. Rohrlänge einen Ablenkungswinkel von —21.4° zeigte, eine Ausbeute von 56%, während das amerikanische Spearmintöl, welches bei 50 mm eine Ablenkung von —18.2° zeigte, nur 35.5% lieferte."

Kremel[13] (1889), who evidently employed the iodine-method, claims to have found only about 30% of carvone in *Krauseminzöl.*

Nicolaysen[15] (1889) finds that although the Norwegian caraway seed yields a larger amount of oil than the Central European, that the former contains less carvone than the latter. The Norwegian oil upon fractional distillation yielded 48.9, 47.1 and 48% of carvone respectively, whereas the Central European oil according to the sp. gr. method was calculated to contain 64.5% of carvone and 35.5% of "carvene".

Experimental Part.

Goldschmidt has shown that carvone combines with hydroxylamine to form an oxime, which is relatively stable. Having had occasion to separate the ketone from the non-ketone constituents of caraway oil by means of the carvoxime reaction it was observed that the yield of carvoxime was about the same in different experiments conducted under similar conditions. This suggested the possibility of utilizing the carvoxime for the quantitative estimation of carvone. With this end in view samples of pure carvone and of pure limonene were prepared.

Preparation of pure carvone.

A quantity of caraway oil was fractionated under reduced pressure (30 mm.) and two fractions, one up to 110°, the other 110° to 125°, were collected. Fraction 110° to 125° was again subjected to fractional distillation under reduced pressure (30 mm.) and the fraction coming over between 120° to 123° was collected separately. This showed the specific gravity 0.957 at 20°, angle of rotation in 100 mm. tube + 59° 7′ at the same temperature.

To this fraction was added ¼ its volume of alcohol and the mixture saturated with hydrogen sulphide; a small quantity of ammonia water was then added. The precipitated crystalline hydrosulphide of carvone was collected and washed with alcohol. The mother liquid was again saturated with hydrogen sulphide, when a second crop of crystals separated. This operation was repeated several times until no further precipitation took place. The yield amounted to 70%. The carvone hydrosulphide was recrystallized from a mixture of 3 parts chloroform and 1 part alcohol as suggested by Beyer. The angle of rotation of a 10% solution in chloroform was + 8°, sp. gr. 1.426 at 20°, hence $[\alpha]_D = +56.101°$ and not +5.53° as reported by Beyer.

The carvone was regenerated by Beyer's method: 3 parts of hydrosulphide were treated with a cold solution of 1 part potassium hydrate in 20 parts of alcohol and allowed to stand three to four hours in the cold. This mixture was then poured into ten times its volume of water and the separated carvone collected and dried. The carvone was slightly yellowish in color and gave the following constants: specific gravity 0.959, angle of rotation +58° 47′, hence $[\alpha]_D = +61.19$.

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* Isomerieverhältnisse innerhalb der Terpenreihe. Inaugural-Dissertation: Göttingen, 1890, p. 81; also Am. Chem. Journ., 17, p. 692.

[10] Monatshefte f. Chemie, 1893, p. 270.

[11] Arch. d. Pharm. 204, p. 317.

[12] Ibidem, 221, p. 284.

[13] Jahresbericht d. Pharm., 1889, p. 363.

[14] Centralhalle, 1883, No. 21, p. 242.

[15] Chem. Zeit., 1889, p. 1704.

Upon distillation with water vapor the carvone came over perfectly colorless. The specific gravity of the dried oil was 0.96058 at 20°. In a 100 mm. tube it turned the plane of polarized light 60° 11′ to the right, hence $[\alpha]_D = +62.65°$.

How slight the changes in specific gravity and angle of rotation of the carvone in these several processes of purification were will become apparent from the following table.

	Sp. Gr. at 20°.	$[\alpha]_D$ at 20°.
Carvone obtained from caraway oil by fractional distillation under 30 mm. pressure............	0.957	+61.75°
Carvone regenerated from carvone hydrosulphide..................	0.959	+61.19°
The same, after distillation with water vapor and drying..........	0.96058*	+62.65°†

Preparation of pure limonene.

From the fraction —110° [30 mm. pressure] pure limonene was obtained by repeated fractional distillation.

A mixture, consisting of equal parts of pure carvone and pure limonene, was then prepared and its carvone content estimated by converting the ketone into carvoxime and weighing the latter. Several slight modifications of the same general process were tried with the object in view of obtaining as pure a carvoxime as possible.

Method I.

To a solution of 10 grams of the 50% carvone mixture in 25 cc. of alcohol, 5 grams of hydroxylamine hydrochlorate and 6.5 grams of sodium bicarbonate are added. This mixture was boiled in a flask connected with a reflux condenser for one hour. 25 cc. of water were then added and the alcohol was distilled off on a water-bath. Steam was then passed through the liquid very slowly, until no more oil or but very little oil came over with the aqueous distillate. The contents of the flask were allowed to cool and the solidified carvoxime removed from the flask, thrown upon a force filter, washed with water and dried by pressing upon a porous plate. When dry it was collected and weighed.

This method gave the following results with the 50% carvone mixture:

I. 5.346 grams carvoxime = 48.60% carvone.
II. 5.234 “ “ = 47.60% “
III. 5.280 “ “ = 48.00% “

There is a loss of about 2% according to this method, due to the fact that complete separation of the limonene from the carvoxime is not accomplished, so that when the soft carvoxime is spread upon the porous plate some of it is absorbed. To remedy this difficulty the following modification was tried.

Method II.

The only change made consisted in carrying the distillation farther than in the preceding experiments. Water vapor was passed through the oily liquid until traces of carvoxime appeared in the condenser. A more complete separation of the limonene was thus effected. The remaining carvoxime was dried on a force filter and weighed.

Ten grams of the carvone mixture yielded:

I. 5.640 grams carvoxime = 51.27% carvone.
II. 5.796 “ “ = 52.68% “
III. 5.971 “ “ = 54.27% “

Here the result is too high and variable, due greatly to the water enclosed by the carvoxime in solidifying, which evidently cannot be removed completely by simply drying in the air. By keeping it upon a water-bath for some time all the water may be driven off. In order to ascertain whether or not any loss of carvoxime was occasioned by this treatment the following experiment was made.

5.678 grams of carvoxime were heated for several hours on a boiling water-bath, weighings being made at intervals of one hour. The accompanying table gives a record of the weight of the carvoxime at the end of one, two, three etc. hours respectively, also the loss in weight observed in each case.

Weight of Carvoxime.	Loss.
5.678 grams.	
5.579 “	...............0.099 gram.
5.473 “	...............0.106 “
5.386 “	...............0.087 “
5.289 “	...............0.097 “
5.189 “	...............0.100 “

The loss of carvoxime by heating is therefore nearly a constant quantity, viz. about 0.100 gram per hour.

Method III.

The mixture of the alcoholic solution and the reagents was boiled upon the water-bath in a flask connected with a reflux condenser for half an hour. 25 cc. of water was then added and the alcohol, which carries over a large quantity of limonene, was distilled off from a water-bath. Steam was then passed through the liquid until traces of carvoxime came over. The last portions of the distillate were collected separately in test-tubes, and when traces of crystals of carvoxime appeared on the surface the operation was interrupted. The tube of the condenser was then washed with a little hot water and this, as well as the last collected distillate, containing some carvoxime, was returned to the flask. The contents of the flask were then allowed to cool and after the carvoxime had completely solidified it was removed from the sides of the flask by means of a loop of stiff wire, thrown upon a force filter, washed and dried by suction. The air-dried carvoxime was then transferred to a tared glass dish and heated for one hour on the water-bath, and when cool weighed. To the weight thus obtained 0.100 gram was added as this is about the quantity lost during heating. From the weight of the carvoxime that of the carvone may be readily calculated:

$$\underbrace{C_{10}H_{14}NOH}_{164.67},\ \underbrace{C_{10}H_{14}O}_{149.66} = 1:0.9088$$

or, the weight of carvoxime expressed in grams when multiplied by 0.9088 gives the weight of the equivalent amount of carvone.

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* Determined with Sprengel's pycnometer, the others by means of the Mohr-Westphal balance.

† The tube was surrounded by a jacket through which a current of water at 20° was allowed to flow.

The 50% carvone mixture[16] gave by this method the following figures:

I. 5.525 grams carvoxime = 50.22% carvone.
II. 5.592 " " = 50.83% "
III. 5.579 " " = 50.71% "
IV. 5.503 " " = 50.00% "

From these figures it will be seen that the results obtained by this method come within one percent of the true carvone content.

Examination of Commercial Caraway Oils.

Several samples of commercial caraway oils were obtained and examined. In the subjoined table the results are arranged for ready comparison.

Commercial Caraway Oils, examined by method II.[17]

	Specific gravity at 20°.		Angle of rotation in a 100 mm tube at 20°.		Carvone content.		Description of carvoxime.		Not volatile with water-vapor.
	Before purification.	After purification.	Before purification.	After purification.	Before purification.	After purification.	Before purification.	After purification.	
1.	0.921		+70° 36′		54.21% 54.00%		Good condition.		
2.	0.909		+77° 4′		47.82% 48.25%		Good condition.		
3.	0.910	0.884	+15° 45′	+18° 39′	?	?	Oily and resinous.	Oily.	13%
4.	0.912	0.894	+68° 41′	+75° 46′	47.38%	41.75%*	Soft, slightly resinous.	Nicely crystalline.	6.5%
5.	0.934	0.897	+66° 15′	+79° 37′	52.65%	46.80%*	Soft and resinous.	Nicely crystalline.	8%
6.	0.895	0.888	+50° 46′	+52° 12′	33.45%	33.65%*	Good condition.	Nicely crystalline.	Slight.

Samples 1 and 2 were remnants from larger quantities that had been used in this laboratory, the others were obtained from different pharmacists. In the case of the purchased oils the resulting carvoxime was so resinous that the oils had to be redistilled with water vapor before an accurate determination could be made. Three of the oils left a considerable residue not volatile with water vapor which therefore had remained with the carvoxime obtained before distillation, increasing it in amount and thus showing a higher carvone content than was found after purification of the oil. In the examination of commercial caraway oil which has become colored or resinified it is therefore always necessary to redistill with water-vapor; otherwise the carvone content will be found to be higher than it really is. The character of the carvoxime, which consists of a colorless crystalline mass when pure, readily reveals the presence of such impurities. Upon purification the specific gravity in all cases decreased, while the rotatory power was increased.

Sample number 4 is interesting, as it had been for at least 20 years upon the shelf of an old pharmacy. It possessed a strong caraway odor, but not as pleasant as that of more recent oils. It was very dark in color, and the nonvolatile residue left upon steam distillation showed that changes had taken place in the oil. By purification the specific gravity was decreased from 0.912 to 0.898 and the angle of rotation increased from 68° 41′ to 75° 46′. The non-ketone constituent distilled from the oxime showed a rotation of 89° 14′. The other samples, with the exception of number 3, may be passed over without further comment.

Number 3 is highly interesting in that it proved to be a grossly though somewhat skillfully adulterated product. This oil was dark in color and possessed a terebinthinate odor. In specific gravity and alcohol solubility it responded to U. S. P. requirements. In optical activity, however, it showed the remarkably low rotation of 15° 45′. A carvone determination was undertaken, but the carvoxime, if such, was so resinous that it would not solidify. The water was poured off and the flask with contents dried and weighed. The weight of the contents was 2.450 gram.

The oil was then distilled with water-vapor and a residue amounting to 13% was left in the flask. The colorless distillate showed the specific gravity 0.884 and an angle of rotation of 18° 39′ at 20°. A carvone determination was made, but it was no more satisfactory than that before purification. The impure carvoxime, if such at all, was oily and had to be weighed with the flask. It had the insignificant weight of 0.554 gram.

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[16] When more carvone is present a larger quantity of hydroxylamine must be used.

* When estimated according to method III No. 4 revealed a carvone content of 42.86% and 42.04%; No. 5 one of 43.29% and 43.38% and No. 6 one of 30.95% and 31.19% respectively, duplicate estimations being made in each case.

In order to make a more thorough examination of the oil, a larger quantity was treated with hydroxylamine and distilled with water-vapor in order to separate the traces of ketone constituent. The distillate showed the specific gravity 0.867 and the angle of rotation was 14° 38′ at 20°. It was subjected to fractional distillation with the following results:

—— —158°	11.0 cc.
158°—159°	10.5 cc.
159°—160°	6.5 cc.
160°—162°	5.0 cc.
162°—164°	3.2 cc.
164°—167°	1.8 cc.
167°—170°	0.6 cc.
170°—175°	1.4 cc.
175°—190°	1.5 cc.

From fraction 158°—159° a nitrosochloride was prepared. The yield was about 30%. It melted at from 105°—106°. By treating this with alcoholic potash an oxime was obtained which, after purification, melted at 129°—130°. By treating another portion of the nitrosochloride with benzylamine, the nitrolbenzylamine base was obtained and purified by crystallization from a mixture of alcohol and ether. The purified benzylamine base melted at from 122°—123°.

These facts show conclusively that the oil under consideration consisted chiefly of pinene. The high specific gravity of the oil is easily accounted for by the presence of the nonvolatile resinous substance. This would also increase the alcohol solubility of the adulterated oil, whereas the presence of large amounts of pinene would tend to decrease the solubility in alcohol.

Examination of Commercial Spearmint Oils.

Only two samples were examined and the carvone content estimated by method I. The results are arranged in a table for better comparison. Sample number 1 was soluble in an equal volume of alcohol but became turbid on further dilution. It was soluble in glacial acetic acid in all proportions and was soluble in three parts of carbon disulphide; beyond this point it became turbid.

Commercial spearmint oils, examined by method I.[17]

		Sp. Gr. at 20°.	α in a 100 mm tube at 20°.	Carvone content.	Description of carvoxime.
1.	Not purified.	0.935		62.41% 64.00%	Soft and resinous.
2.	Before purification.	0.942	—46° 27′	57.63% 58.59%	Solidified with difficulty.
	After purification.	0.933	—47° 45′	59.68%	Nicely crystalline.

Sample number 2 was also soluble in an equal volume of alcohol, becoming turbid on further addition of alcohol. After purification, however, it was soluble in alcohol, in carbon disulphide, and in glacial acetic acid in all proportions.

This method for the estimation the carvone content of volatile oils by means of carvoxime certainly meets the requirements of a thoroughly scientific process of assay. Although the estimation is not absolutely perfect, yet the results are surprisingly good for such complex mixtures as volatile oils are. The fact that a poor oil, rich in nonvolatile constituents, gives no good results directly, but must be rectified, is not so much a disadvantage as it is a point in favor of this method.

It may be objected that the method though highly satisfactory when compared with others is too scientific and not sufficiently practical. In reply to such an objection attention may be called to the fact that 99% of the druggists will no more employ the boiling point method, though eminently simple, than the carvoxime method. On the other hand those who possess the requisite knowledge and skill will not only find this method more accurate, and therefore more satisfactory, but even simple when compared with other processes of pharmacopœial assay. The small amount of oil that suffices to afford good results certainly is a strong point in favor of the carvoxime method.

This process is now being further tested with regard to its application to the assay of more skillfully adulterated oils. The test will also be made whether students with but a very moderate experience in drug assaying can use the method to advantage.

Pharm.-Chem. Laboratory,
University of Wisconsin.

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Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.—Continued.

Pisonia aculeata L. In den Staaten S. Paulo, Minas und Rio de Janeiro. Bekannt als *Cipo molle* — Weiche Liane.

Ein bis zwei Meter hoher, dorniger Strauch mit gegenständigen, länglich ovalen, stumpflichen, hellgrünen Blättern. Blüthenstand achselständig, in Corymben, mit zweigeschlechtlichen, kleinen,

Pisonia aculeata L. In the states S. Paulo, Minas and Rio de Janeiro. Known as *Cipo molle*, soft liana.

A thorny shrub reaching a height of two meters with opposite, oval-oblong, blunt, bright green leaves. Inflorescence, axillary corymbs with small greenish-yellow, bisexual, weakly-fragrant

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[17] These oils were estimated before method III had been devised. The caraway oils, 4, 5 and 6 were again estimated by method III.

* Continued from p. 51. Translated for the Review by Dr. R. H. True, instructor in pharmacognosy at the University of Wisconsin.

grünlichgelben Blüthen von schwachem Wohlgeruch. Die Frucht eine Caryopse, mit kleinen krummen Stacheln bekleidet, wird von den Vögeln sehr gesucht.

Ein Extract der Früchte dient als Insektenleim. Das Decoct der Blätter ist ein beliebtes Volksmittel zur Heilung des Trippers.

Pisonia subcordata Sw. An den sandigen Küstenstrecken der tropischen Staaten von Rio de Janeiro bis zum Staate Alagoas. Bekannt als *Ramalhete do mato* — Waldblumenstrauss, im Norden als Paó mondé — Zahnstocherbaum.

Ein ansehnlicher Baum mit zwei- und dreigabelig verzweigten Aesten, und mit gegenständigen, herzförmig ovalen oder länglich ellyptischen, stumpflich zugespitzten Blättern. Blüthenstand in grossen Trugdolden mit diœcischen, hellgrünen Blüthen und rothen Blüthenstielen.

Das weisse Holz lässt sich leicht spalten und wird zu den verschiedensten häuslichen Utensilien benutzt, ferner zu Zaunpfählen etc. Das Decoct der Rinde wird zu Bädern bei Geschwulst der Füsse gebraucht, auch als Waschwasser zur Reinigung alter Wunden.

Zu gleichem Zwecke wird benutzt der im Staate Pernambuco vorkommende baumartige Strauch *Pisonia cordifolia* Mart., welcher unter dem Volksnamen *Ciomichá* bekannt ist.

Pisonia pubescens H., B., & Kth. In dem Staate Rio de Janeiro nördlich bis Bahia. Bekannt als *Gerimú* und *Paó gerimú*.

Ein vier bis fünf Meter hohes Bäumchen mit dichotomischen knotigen Aesten und verkehrt eiförmig-länglichen, kurz zugespitzten Blättern, welche oberseits glänzend dunkelgrün, unterseits rostfarben filzig sind. Die Dolden sind traubige Trugdolden mit grünen Blüthen.

Die Rinde des Baumes ist rothgelb, ähnlich der Jerumu-kürbissschale — deshalb die Benennung — und wird als Adstringens benutzt. Das Holz wird zum Häuserbau, vorzugsweise zu Dachsparren und Schindeln, sowie zu verschiedenen häuslichen Geräthschaften verwandt.

Pisonia alcalinia Fr. Allem. Kommt vor im Staate Cearà und ist unter den Volksnamen *Mangue branco* — Weisser Mangle und *Tapaceriba branco* bekannt.

Ein kleiner, dem Mangle ähnlicher Strauch. Die frische Wurzel in der Dosis von sechs Gramm wirkt brechenerregend und abführend. Getrocknet soll dieselbe nur abführend wirken. Bei chronischer Bronchitis, Gelbsucht etc. wird sie benutzt.

Pisonia Olfersiana Link. Im Staate Rio de Janeiro, am Flusse Rio Negro bei Cantagallo ziemlich häufig.

Ein kleines elegantes Bäumchen mit armesdickem Stamme und 44 ctm. langen lancettlichen Blättern. Der Blüthenstand ist eine faustgrosse, rundliche Trugdolde mit wohlriechenden, perlenähnlichen, fleischroth glänzenden Blüthen; deshalb die Benennung: *Flor de perolas* — Perlenblüthe.

Die fleischige bräunlichrothe Wurzelrinde dient als mildwirkendes Abführmittel und zwar 30 Gramm zu 300 Gramm Decoct in drei Dosen stündlich genommen.

Pisonia tomentosa Casar. Auf den steinigen Hochebenen des Camposgebietes der Staaten S. Paulo, Minas, Bahia und Goyaz. Bekannt als *Paó lepra* — Aussatzbaum; *Paó Judeo* — Judenbaum; *Joaõ molle* — Weicher Johann.

Ein schöner bis acht Meter hoher Baum mit verschieden gedrehten knorrigen Aesten. Die jün-

flowers. The fruit, a caryopsis covered with small crooked prickles, is much sought by birds.

An extract of the fruits furnishes insect lime. The decoction of the leaves is a favorite popular remedy for gonorrhoea.

Pisonia subcordata Sw. Along the sandy coast regions of the tropical states from Rio de Janeiro to the state Alagoas. Known as *Ramalhete do mato* — forest-flower nosegay, in the north as *Paó mondé* — toothpick tree.

A considerable tree with twice or thrice forking branches, and with opposite, oval-cordate or oblong-elliptical, bluntly-pointed leaves. Inflorescence, large dichotomous cymes with bright green diœcious flowers and red peduncles.

The white, easily split wood is used for the most various household utensils, also for fence posts etc. The decoction of the bark is used for bathing also as a wash for cleansing old wounds.

For the same purpose, the tree-like shrub *Pisonia cordifolia*, Mart. is used. This plant occurs in the state of Pernambuco and is popularly called *Ciomichá*.

Pisonia pubescens H., B., & Kth. In the state Rio de Janeiro northward as far as Bahia. Is called *Gerimú* and *Paó gerimú*.

A small tree four to five meters high with dichotomous, knotty branches and ob-lanceolate-ovate, short pointed leaves which on the upper side are shining, dark-green, beneath rusty tomentose. The cymes are racemous with green flowers.

The bark of the tree is reddish-yellow resembling the Jerumu gourd — hence the name — and is used as an astringent. The wood is used in house-building, mainly as rafters and shingles; also is made into different household utensils.

Pisonia alcalinia Fr. Allem. Occurs in the state Cearà and is known among the people by the names, *Mangue branco*, white mangle, and *Tapaceriba branco*.

A small shrub resembling the mangle. The fresh root in a dose of six grams acts as an emetic and cathartic; when dried it is said to act only as a purgative. It is used in chronic bronchitis, jaundice etc.

Pisonia Olfersiana Link. Quite abundant in the state Rio de Janeiro on the Rio Negro River near Cantagallo.

A small, graceful tree with a stem of the thickness of the arm, and long lanceolate leaves of 44 ctm. length. The inflorescence is a roundish cyme of the size of the fist with fragrant pearly flesh-colored, shining flowers, hence the name, *Flor de perolas*, pearl flower.

The fleshy, brownish-red bark of the root is used as a mild purgative. A decoction of 30 grams to 300 grams is taken in three doses per hour.

Pisonia tomentosa Casar. On the stony uplands of the Campos region of the states S. Paulo, Minas, Bahia and Goyaz. Known as *Paó lepra*, leprosy tree; *Paó Judeo*, Jew's tree; *Joaõ molle*, soft John.

A fine tree reaching a height of eight meters with knotty branches variously twisted. The geren Aeste sind mit rostfarbenem Filze bedeckt. Die Blätter sind länglich-oval, bauschig-runzelig, oberseits dunkelgrün, unterseits gelb, roth befilzt. Der Blüthenstand ist eine achselständige schirmförmige Scheindolde.

Diese sowohl als auch die kleinen männlichen und weiblichen Blüthen sind mit einem fuchsrothen Filze dicht bekleidet. Der filzige Ueberzug der Pflanze soll bei Berührung auf der blossen Haut starkes Jucken und knotiges Enzem verursachen; deshalb die erste Benennung. Die letzte Benennung kommt dem Baume von wegen des weichen Holzes zu. Weshalb derselbe Judenbaum benannt wird, darüber konnte ich keine Aufklärung erhalten.

Das Holz ist leicht schneidbar und werden Löffel davon geschnitzt. Es ist weiss, wird aber nach kurzer Zeit schwarzgrau. Das Decoct der Blätter dient zum schwarzviolett färben baumwollener Zeuge. Die Blätter sowohl als auch die Rinde sind energisches Adstringens.

Neea theifera Oersted. (Fig. 1.) Auf dem Camposgebiet der Staaten Minas, Goyaz und Matto Grosso.

Ein Strauch, welcher eine Höhe von drei Meter erreicht, mit hin- und hergewundenem Stamm von acht bis zehn Ctm. Durchmesser und hellbrauner, glänzender, korkartiger, rissiger Rinde. Die Blätter sind ganzrandig, länglich, stumpfzugespitzt, am Grunde kaum bemerkbar herzförmig. Der Blüthenstand ist eine aufrechte Rispe mit diœcischen, kleinen, rosarothen Blüthen.

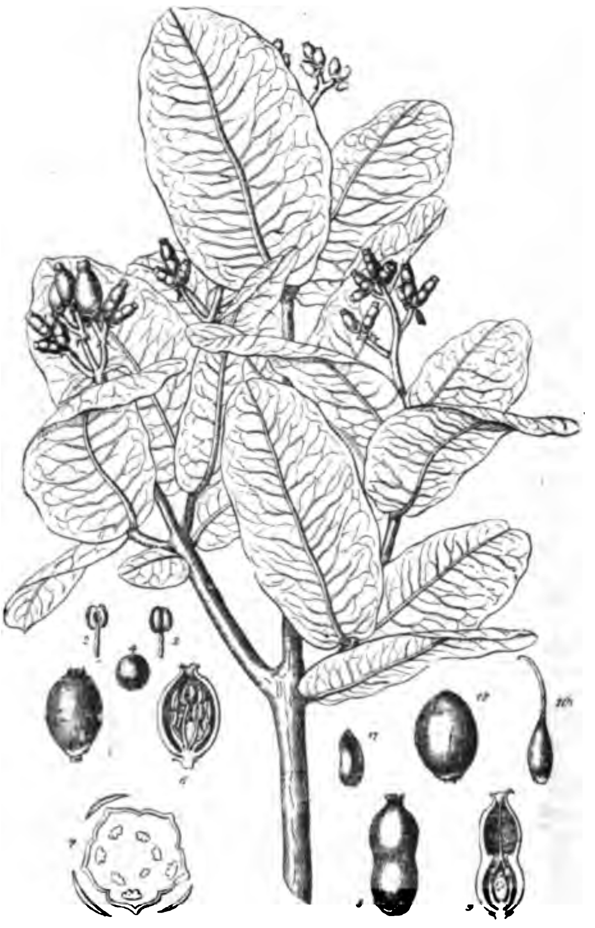
Die Blätter werden zum Schwarzfärben baumwollener Zeuge benutzt, deshalb die Benennung *Caparrosa*— Eisenvitriol. Der Aufguss der trockenen Blätter wird vom Volke als Ersatz des indischen Thees getrunken; dieselben sollen nach Schwarding und Oersted ¼ Procent Coffein enthalten.

Boerhavia paniculata Rich. In der tropischen und heissen Zone, von Rio de Janeiro bis zum Aequator. Wird in den Tropenstaaten *Tangeraca* benannt, in den nördlichen Staaten *Herva Tostão.*

Die Benennung *Tangeraca* haben noch mehrere Pflanzen, als: *Rubia noxia* St. Hil., *Psychotria Marcgravii* Sp., *P. ruelliaefolia* Muell. Arg., *Miconia guianensis* Cogn., *Eclinta palustris* Vellos.

Kriechend strauchartige Pflanze mit sehr langgestielten, ungetheilten, oval-gerundeten, gewimperten Blättern. Die Blüthenrispe mit sehr kleinen purpurrothen Blüthen.

Die neuen Blätter werden als Gemüse genossen, die Wurzel als blutreinigendes und harntreibendes Mittel eingenommen.



1. Neca therifera Oersted.

younger branches are covered with a rusty tomentum. The leaves are oval-oblong, rugose, above dark-green, beneath, yellow, tomentose. The inflorescence is an umbrella-shaped false cyme.

This as well as the small male and female flowers are clothed with a dense, fox-red tomentum. The tomentum of this plant on contact with the bare skin is said to cause a strong itching sensation and nodular swellings, hence the first name. The last name is given to the tree on account of its soft wood. Why it is called the Jews tree remains unexplained.

The wood is easily cut and spoons are carved from it. It is white, in time becoming, however, blackish-gray. The decoction of the leaves serves to dye cotton fabrics a blackish-violet. The leaves as well as the bark act as strong astringents.

Neea theifera Oersted. (Fig. 1.) In the Campos region of the states of Minas, Goyaz and Matto Grosso.

A shrub attaining a height of three meters, with a zig-zag winding stem of eight to ten ctm. diameter, with light-brown, shining, corky, fissured bark. The leaves are entire, oblong, bluntly pointed, at the base hardly perceptibly cordate. The inflorescence is an upright panicle with small, diœcious, rose-red flowers.

The leaves are used to stain cotton fabrics black, hence the name *Caparrosa,* iron-vitriol. The infusion of the dried leaves is used as a substitute for Indian tea; the leaves are said by Schwarding and Oersted to contain ¼ percent caffein.

Boerhavia paniculata Rich. In the tropical, hot zone, from Rio de Janeiro to the equator. In the tropical states is called *Tangeraca,* in the northern states *Herva Tostão.*

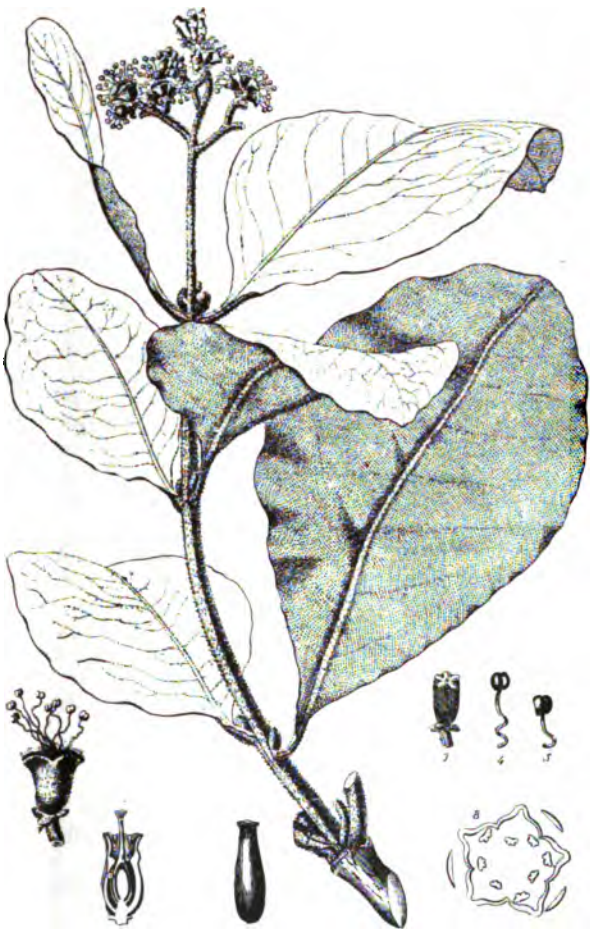
The name *Tangeraca* is shared by many plants, as: *Rubia noxia* St. Hil., *Psychotria Marcgravii* Sp., *P. ruelliaefolia* Muell. Arg., *Miconia guianensis* Cogn., *Eclinta palustris* Vellos.

Shrubby, creeping plants with very long-petioled, undivided, oval-rounded, ciliate leaves. The floral panicle with very small purple-red flowers.

The new leaves are eaten as "greens." The root is used as a blood purifier and diuretic.

Boerhavia hirsuta Willd. (Fig. 2.) Vom Staate S. Paulo nördlich bis zum Aequator. Besonders häufig in den Staaten Minas und Rio de Janeiro. Kommt vor als Unkraut auf kultivirten Ländereien, wird aber auch oft in den Gärten kultivirt.

Im Staate Pernambuco heisst es *Bredo de porco* — Schweins Amaranth; in Bahia und Alagoas: *Pega pinto* — Küchleinklette, in Ceará und Sergipe: *Papo de perú* — Truthahnkropf; hier und den anderen Staaten: *Herva de tostão* — Hundertreiskraut.



2. **Boerhavia hirsuta Willd.**

Eine krautartige, kriechende, rauhhaarige Pflanze mit kurzgestielten, gegenständigen, länglich-ovalen, etwas spitzen, kurzhaarigen Blättern. Der Blüthenstand besteht in einem ausgepreitzten, laxen Rispchen mit sehr kleinen rothen Blüthen. Die Frucht ist keulenförmig, drüsig-klebrig, höchstens zwei Millimeter lang.

Die Pflanze ist ein Universalheilmittel der Brasilianer und fehlt in keiner Haushaltung, auch wird dieselbe vielfach von Aerzten verschrieben. Der Saft der frischen ausgepressten Blätter dient zur Kräuterkur. Des Morgens wird eine kleine Tasse voll getrunken bei Leberverhärtung, Unterleibsstockung und Gelbsucht.

Einige Autoren geben an, dass die jungen Blätter als Gemüse genossen werden, welches ohnstreitig eine Verwechselung mit *B. paniculata* ist; es geschieht nie, da die jungen Blätter noch rauhhaariger als die älteren und nicht geniessbar sind.

Das am meisten geschätzte Heilmittel ist die Wurzel. Oken, Rosenthal und andere bezeichnen dieselbe als Brech- und Abführmittel, was durchaus nicht der Fall ist. Kein hiesiger Arzt hat diese Wirkung beobachtet. Ich habe ein concentrirtes Decoct getrunken und nur starke harntreibende Wirkung beobachten können.

Die Aerzte verordnen am häufigsten das Decoct, seltener das Pulver und Extract. Es gilt als desobstruens und diureticum. Es wird angewandt bei Milzaffectionen zufolge der Sumpffieber, bei gastrischbiliösen Fiebern, Gallenkolik und Gelbsucht, Nieren- und Harnblasenaffectionen, Hämorrhoidalbeschwerden und vorzugsweise bei Leberaffectionen.

Das Decoct von 12 Grm. Wurzel zu 360 Grm. Colatur wird Kelchglasweise dreistündlich eingenommen; öfters auch ein Decoct aus 60 Grm. zu 720 Grm. Colatur. Die officinelle *Tisana desobstruente* besteht aus *Decoctum Radicis Boerhaviae* 500 Grm., mit *Tartarus boraxatus* 10 Grm., *Natrium bicarbonicum* 4 Grm., *Syrupus aperientes* 30 Grm.

Boerhavia hirsuta Willd. (Fig. 2.) From the state of S. Paulo northward to the equator. Especially abundant in the states Minas and Rio de Janeiro. Occurs as a weed in cultivated lands, often also cultivated in the gardens.

In the state of Pernambuco it is called *Bredo de porco* — swine's amaranth; in Bahia and Alagoas: *Pega pinto* — chicken-bur; in Ceará and Sergipe: *Papo de perú* — turkey-crop; here and in the remaining states, *Herva de tostão* — Hundred-branch plant.

An herbacious, creeping, roughly pubescent plant with short-petioled, opposite, oval-oblong, somewhat pointed leaves with short pubescence. The inflorescence is a spreading, divaricate, lax panicle with very small, red flowers. The fruit is clavate, clammy-glandular, at the most two millimeters long.

The plant is a universal remedy among the Brazilians and is lacking in no household; it is also much prescribed by physicians. The sap pressed from the fresh leaves is used in the herb cure. A small cupful is taken in the morning for induration of the liver, intestinal stoppage and jaundice.

Some authors state that the young leaves are used as "greens," but there is undoubtedly a confusion with *B. paniculata*, since the young leaves are still more roughly pubescent than the older and are not edible.

The most highly prized remedy is the root. Oken, Rosenthal and others class it as emetic and purgative, — a mistake, since no physician here has observed this action. I have drunk a concentrated decoction and could notice only a strongly diuretic action.

The physicians prescribe most commonly the decoction, more rarely the powder and the extract. It acts as deobstruent and diuretic. It is administered in splenic affections following the swamp fever, in gastric-bilious fevers, calculary colic and jaundice, kidney and bladder complaints, hemorrhoidal troubles and especially for liver affections.

A wineglassful of the decoction from 12 grm. of the root to 360 grm. of the colature is taken every three hours; frequently also a decoction from 60 grm. of the root to 720 grm. of the colature is used. The official *Tisana desobstruente* consists of *Decoctum Radicis Boerhaviae*, 500 grm., with *Tartarus boraxatus*, 10 grm., *Natrium bicarbonicum*, 4 grm., *Syrupus aperientes*, 30 grm.

Von diesem Präparat wird zweistündlich ein Kelchglas voll genommen.

Das Extract wird in der Dosis von 0.1 Grm. mit Wurzelpulver in Pillenform verschrieben. Bei Convulsionen der Kinder, verursacht durch Wurmreiz, werden 0.2 bis 0.4 Grm. Wurzelpulver mit *Jetahy* honig gemischt, dreimal täglich gegeben.

Bei Schlangenbiss, wenn die Pflanze in der Nähe, wird eine Wurzel gekaut und genossen, eine zweite gekaute Wurzel auf die Bisswunde gebunden. Zu Hause angekommen werden vier bis fünf Wurzeln mit einer halben Flasche Zuckerbranntwein angestossen, ausgepresst und alle Viertelstunde ein Liquörglas voll getrunken. Die ausgepresste Wurzel, mit etwas Wasser angerührt, wird als Umschlag auf die Bisswunde gebunden.

Die Wurzeln sind rübenförmig, mit brauner Epidermis, sehr spitz endend und am Ende mit feinen hellbräunlichen Wurzelfasern besetzt. Die dickeren Wurzeln sind sechs bis zwölf Ctm. lang und haben am oberen Theil einen Durchmesser von 25 Millimeter. Die dünneren Wurzeln sind 25 Ctm. lang und oben nur 12 Millimeter dick. Das Mark ist weiss. Gekaut besitzen dieselben einen unangenehm salzigen Geschmack und verursachen ein belästigendes Jucken auf der Zunge.

Die frischen und getrockneten Wurzeln wurden untersucht, doch konnte weder durch Ausschütteln noch durch anderweitige Processe ein krystallinisches Product erhalten werden. Durch Ausschüttelung mit Amylalcohol wurde eine amorphe bitterschmeckende Substanz erhalten, welche nur in Amylalcohol, Alcohol und Wasser löslich war. Mit Mayer's Reagens gab die Lösung ein voluminöses Präcipitat, mit anderen Alkoloidreagentien und mit Gerbsäure jedoch keine Reaction.

In der frischen Wurzel wurden gefunden:

Wasser	47.241	Procent.
Fettes Oel	0.252	"
Eiweiss	0.300	"
Stärkemehl	15.800	"
Zucker	1.000	"
Bitterstoff	0.579	"
Harzsäure	0.173	"
Extract etc	3.950	"
Asche	8.620	"

Das fette Oel ist dickflüssig, gelbbraun, geruchlos, von widerlich unangenehmen kratzenden Geschmack. Mit Schwefelsäure färbt es sich dunkelbraun und wird schmierig und klebend, während die Säure farblos bleibt. Die Harzsäure ist geruch- und geschmacklos, nur löslich in Alcohol und Ammoniak.

In den Staaten Minas und Goyaz wird als *Herva tostão* die *Boerhavia erecta* L. benutzt.

Andradea floribunda Allem. Im Staate Rio de Janeiro. Heisst *Battam* und *Tapaceriba amarella*,

Ein hoher Baum mit dickem Stamm und grauer, korkartiger, rissiger Rinde. Die Blätter sind ganz randig, länglich-oval, zugespitzt, oberseits dunkelgrün, unterseits grauweiss befilzt. Blüthenstand endständig und zwar eine reichblühende, prachtvolle Rispe mit grünlich-weissen, sammtartig befilzten Blüthen. Die Frucht ist nussartig mit kleinen braunen Samen. Das feste violett-röthliche Holz ist ein vorzügliches Bauholz und wird auch zu Möbeln benutzt, während die Sägesspäne zum Färben der baumwollenen Zeuge Anwendung findet,

Andradea dulcis Allem. Im Staate Para heisst dieselbe *Casca doce* — Süsse Rinde,

A glassful of this preparation is taken every two hours.

The extract is given in a dose of 0.1 grm. made into pills with the powder of the root. In convulsions in children caused by irritation from worms, 0.2 to 0.4 grm. of the powdered root is mixed with *Jetahy* honey and given three times daily.

In snake bite, if a plant can be found near by, a root is chewed and swallowed, a second is chewed and bound to the wound. On arriving at home, four or five roots are crushed in half a bottle of sugar brandy and the juice expressed; a liquorglass full being taken every quarter-hour. The root-pulp is then stirred with water and bound to the wound.

The roots are turnip-shaped, with brown epidermis, ending very pointedly and at the end covered with fine, light-brownish, fibrous roots. The thicker roots are six to twelve ctm. long, and have in the upper part a diameter of 25 mm. The thinner roots are 25 ctm. long with a diameter above of only 12 mm. The pith is white. When chewed, they have an unpleasant saline taste and cause an annoying itching of the tongue.

The fresh and the dried roots were investigated, but neither by shaking nor by any other process could a crystalline product be obtained. By shaking with amylalcohol, an amorphous, bitter tasting substance was yielded, soluble only in amylalcohol, alcohol and water. With Mayer's reagent, the solution gave a voluminous precipitate; with other alkaloid reagents and with tannic acid, no reaction was observed.

In the fresh root was found the following:

Water	47.241	Percent.
Fatty oil	0.252	"
Proteid	0.300	"
Starch	15.800	"
Sugar	1.000	"
Bitter principle	0.579	"
Resin acid	0.173	"
Extract etc	3.950	"
Ash	8.620	"

The fatty oil is thick, yellowish-brown, odorless with a repulsively unpleasant, rough taste. With sulphuric acid, it takes on a dark-brown color, becoming smeary and sticky while the acid remains colorless. The resin acid is odorless and tastless, soluble only in alcohol and ammonia.

In the states Minas and Goyaz, *Boerhavia erecta* L. is used as *Herva tostão*.

Andradea floribunda Allem. In the state Rio de Janeiro. Is called *Battam* and *Taperceriba amarella*.

A tall tree with thick stem and gray, corky, much fissured bark. The leaves are entire, oval-oblong, acuminate, on the upper side dark green, below grayish-white, tomentose. Inflorescence terminal, a richly flowering, showy panicle with greenish-white, velvety-pubescent flowers. The fruit is nut-like with small, brown seeds. The firm, reddish-violet wood is an excellent building material and is also used for furniture. The sawdust is used as a dye for coloring cotton fabrics.

Andradea dulcis Allem. In the state Para, is called *Casca doce* — sweet bark.

Ein grosser Urwaldbaum, welcher ebenfalls gutes Bauholz liefert. Die Rinde wird wie *Monesia*rinde benutzt, soll auch zur Verfälshung derselben angewandt werden.

A large tree of the primeval forests which likewise furnishes good building timber. The bark is used as *Monesia* bark, and is said to be used for the adulteration of the same.

◆

Notes on Bismuth Subgallate and Subtannate.

By *Ferd. A. Sieker.*

About one year ago the writer published[1] two methods for preparing bismuth subgallate. One method consisted in precipitating a solution of bismuth nitrate in nitric acid and water with a warm aqueous solution of gallic acid. The other method was by the action of gallic acid on bismuth subnitrate in the presence of water at 50° C.

The latter method was recommended for its simplicity and the lightness of the resulting salt. Experience has shown, however, that all bismuth subnitrates are not adapted for this method, some forming a product not entirely soluble in a solution of sodium hydroxid and therefore containing uncombined oxid. That commercial bismuth subnitrates vary considerable in composition has again been recently shown by Prof. Curtman.[2] Bismuth subnitrates assaying a high percent of Bi_2O_3 will not form a pure subgallate; in the writers experience a salt assaying about 80% will generally form a pure subgallate, but there are exceptions to this rule. To illustrate, four samples of subnitrate assaying 79.9, 79.9, 80.3 and 80.4% of Bi_2O_3 respectively, yielded subgallates that were perfectly soluble in a solution of sodium hydroxid while another sample assaying 80.2% of Bi_2O_3 yielded a subgallate which was not perfectly soluble. The percent of acid present in the subnitrates mentioned above was not determined, but Prof. Curtman has shown that two samples assaying the same percentage of Bi_2O_3 do not necessarily contain the same quantity of nitric acid. This variation may be caused by the extent of dilution of the solution used for precipitation, the extent to which it is neutralized during precipitation, the temperature, the amount of water used in washing and probably to other causes.

In selecting a subnitrate for preparing the subgallate determine the percent of Bi_2O_3, and if it assays about 80%, treat a small quantity with six times its weight of water and 0.81 times as much gallic acid as there is Bi_2O_3 in the quantity of subnitrate employed. Instead of heating to 50° C., as recommended a year ago, heat to about 60 to 65° C. for several hours. If the product of the reaction is perfectly soluble in a solution of sodium hydroxid the subnitrate is acceptable for the purpose.

As stated a year ago this method yields a voluminous impalpable powder which possesses certain advantages over a heavier salt such as results when preparing it by direct precipitation.

A third and very simple method may be mentioned which consists in treating 466 parts of powdered normal bismuth nitrate, $Bi(NO_3)_3+H_2O$, with a warm (40° C.) solution of 188 parts of gallic acid in 4000 parts of water. The resulting subgallate possesses a beautiful yellow color and is perfectly soluble in a solution of sodium hydroxid (compare bismuth subtannate).

In preparing bismuth subgallate according to any of the processes mentioned above it should be rapidly washed until the washings no longer redden blue litmus paper. If the washing is carried further decomposition slowly sets in.

Bismuth Subtannate.

A chemical formula for this salt does not appear to have been published. The formula $C_{14}H_9O_9Bi(OH)_2$ requires 41.5% of Bi_2O_3 but as tannic (digallic) acid is a monobasic pentoxyacid we may expect a salt of the composition, $C_{14}H_7O_9Bi$ which if anhydrous would require 44.17% of Bi_2O_3 and with two molecules of water of crystallization 41.50% of Bi_2O_3.

Richter in his Organic Chemistry (2nd edition by Prof. Smith) states that tannic acid "generally forms salts with two equivalents of metal; these are obtained pure with difficulty." Roscoe and Schorlemmer in their Treatise on Chemistry (Vol. III, part IV, page 374) state that tannin "is a monobasic, the salts of which are amorphous and difficult to prepare pure." E. Schmidt in his Pharmaceutische Chemie (2nd edition, Vol. II, page 905) makes the following statement: "Dieselben besitzen nur sehr geringe Beständigkeit und meist eine sehr wechselnde Zusammensetzung."

Hager[3] gives a method for preparing this salt according to which equal parts of tannic acid and bismuth hydroxid are employed; the excess of acid being removed with diluted alcohol. This forms a much more basic salt than that described above.

E. Dieterich in his Manual (5th edition) gives a method according to which about equal molecules of bismuth hydroxid (BiO.OH) and tannic acid in water are evaporated to dryness. The resulting product assays about 40% of Bi_2O_3 but contains free tannic acid which can be removed by shaking it with water and filtering. A sample treated in this manner without carrying the washing very far yielded 56% Bi_2O_3.

A commercial sample was examined which yielded 52.4% of Bi_2O_3. It was a heavy powder possessing a dirty yellow color which was due to oxidation. Another sample of lighter color assayed 36.2% of Bi_2O_3.

In order to determine if a pure salt can be prepared by the action of tannic acid on bismuth subnitrate in the presence of water the following experiment was repeated a number of times:—30 parts of subnitrate (assaying 79.9% of Bi_2O_3) was mixed with 34 parts of tannic acid and 150 parts of water and heated for several hours on a water-bath. The resulting products after washing and drying assayed: I, 48.3%; II, 53.7%; III, 46.32% and IV, 54.2% of Bi_2O_3.

In the last experiment a considerable excess of gallic acid was employed and in each case the mother-liquid gave a strong reaction for tannic acid. These results indicate that this method is not suitable for preparing a pure subtannate.

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[1] Pharmaceutische Rundschau, March 1895.

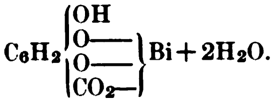
[2] Pharmaceutical Review, Vol. 14, p. 12.

[3] Manuale Pharmaceuticum, Editio Sexta.

The action of a solution of pure tannic acid on normal bismuth nitrate was next tried; the experiment was performed as follows:

233 parts of normal bismuth nitrate was rubbed to a powder in a porcelain mortar and a solution of 170 parts of tannic acid in 1000 parts of water was added under constant stirring with a pestle, then another 1000 parts of water was added and the mixture set aside for several hours. It was then washed by decantation until the washings were no longer acid, collected on a filter and dried first at the ordinary temperature and finally at about 60° C. for a short time. After sifting, a voluminous impalpable canary-yellow powder resulted which resembles the subgallate very much in appearance. It assayed 40.3, 41.7 and 41.8% of Bi_2O_3 (3 estimations) which conforms very closely to the theoretical requirement of a salt of the formula $C_{14}H_7O_9Bi2H_2O$ or $C_{14}H_9O_9Bi(OH)_2$ both of which demand 41.5% of Bi_2O_3.

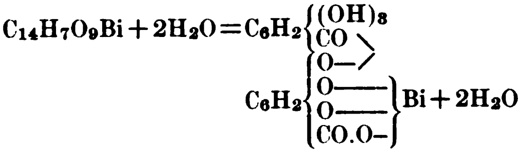
It would appear that Causse[4] has proven that the formula for bismuth subgallate is:



$$C_6H_2\begin{cases}OH\\ O—\\ O—\\ CO_2—\end{cases}\!\!\Big\}Bi + 2H_2O.$$

He attributes the yellow color of this salt to the saturation of two phenol (OH) groups with 2 bismuth bonds as shown in the above formula. To substantiate this he has prepared a white salt from triacetylgallic acid of the formula $(C_2H_3O.O)_3C_6H_2CO.OBi(OH)_2$. He also found that the subgallate lost 9% or 2 molecules of water at 100° C.

As bismuth subtannate also possesses a yellow color we may expect that it has the composition:



$$C_{14}H_7O_9Bi + 2H_2O = C_6H_2\begin{cases}(OH)_3\\ CO\diagdown\\ O—\diagup\end{cases}$$
$$C_6H_2\begin{cases}O—\\ O—\\ CO.O—\end{cases}\!\!\Big\}Bi + 2H_2O$$

The writer has, however, in no way conducted experiments which will substantiate this view.

Bismuth subtannate, prepared as above, is a voluminous impalpable canary-yellow powder resembling the subgallate in appearance. It may be distinguished from the latter by being but very slowly soluble in a 50% solution of sodium hydroxid at the ordinary temperature but readily soluble in a boiling solution. The subgallate dissolves almost instantly in a cold solution of sodium hydroxid.

Laboratory of Lehn & Fink, New York.

◆

The Pollen of Typha latifolia L.

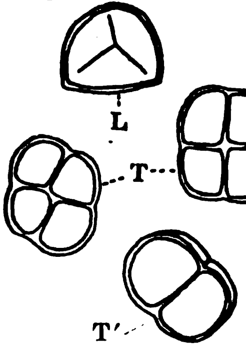
By Dr. *Rodney H. True.*

The great abundance in many localities and the readiness with which it can be gathered, suggests that the pollen of the common cat-tail, *Typha latifolia* L., might be of interest to the pharmacist.

Although noted by a number of European authors as a frequent adulterant of lycopodium powder, in company with the pollen of the pines and the hazel, no evidence has been found indicating that it has been put to this use in America. An examination of a number of samples from various sources has failed to reveal its presence.

In this connection it is of interest that in Japan the pollen of a related species, *Typha Japonica* Miq., is used as a drug called *Hoh-oh.* It is described as being inflammable like lycopodium. In China, the pollen from *Typha bungeana* is used as a desiccant, astringent, styptic and sedative and is also made into a confection for external and internal use. It has neither taste nor odor.[1]

In the mass, the pollen of our cat-tail has a bright yellow color much deeper than the pale, creamy yellow of the lycopodium. When rubbed between the fingers, much the same slippery feeling though less marked than in the latter, is noticed. It is also somewhat more readily wetted by water. The pollen is tasteless and has a faint odor resembling somewhat that of a freshly opened pumpkin.



L. Lycopodium spore.
T. Typha pollen grains seen endwise.
T′. Typha pollen grain seen from side.
Both magnified 400 times.

When examined microscopically, a quite distinctive structure is observed. The pollen grain is four-celled, the two dividing planes cutting each other at right angles and perpendicularly to the same plane, giving to the object when seen endwise with reference to the individual cells, a packet-like appearance. (See cut.) The surface unless highly magnified appears smooth. It is very slightly roughened with minute projections. The contents have a granular appearance. In size the pollen grain is approximately the same as the lycopodium spore.

The average size of the latter is 0.033 mm. varying between 0.030 mm. and 0.036 mm. The average size of the pollen grain is 0.035 mm. varying between 0.033 mm. and 0.039 mm. When the pollen is shaken from the cat-tail spikes, numerous small fibres are found. These slender, thin-walled structures are present abundantly in the male flowers with the stamens and easily fall off when the pollen is gathered. The material here described was gathered at Madison, Wis., in the summer of 1895.

◆

Das historisch-pharmaceutische Central-Museum zu Nürnberg.*

Von Dr. *Hermann Peters in Nürnberg.*

Als das pharmaceutische Central-Museum das erste Jahrzehent seines Bestehens im Jahre 1894 hinter sich hatte, drohte die Gefahr, dass die Weiterentwicklung und der Ausbau desselben an

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[4] Pharmaceut. Ztg., 1893, p. 568; from Compt. rend 193, p. 232, and Chemiker Zeitung, 1893, p. 594, and Pharmac. Rundschau, 1895, p. 65.

[1] Pharm. Journ. Trans. Sept. 13, 1879, 202. Proc. Am. Pharm. Assoc. 28, (1880), 103.

Geldmangel scheitern könnte. Nach dem bei der Gründung gestellten Voranschlage war zur Beschaffung einer des deutschen Apothekerstandes würdigen pharmaceutischen Sammlung mindestens die Summa von 40,000 M. erforderlich. Kaum der dritte Theil dieses Betrages war bis dahin zu dem Zwecke zusammen gebracht und verausgabt worden. Mit diesen Mitteln ward zunächst eine historische Apotheke und einige Jahre später das alchemistisch-pharmaceutische Laboratorium eingerichtet.

Auch das Archiv und die Bibliothek erhielten reiche Zugänge an werthvollen alchemistisch-pharmaceutischen Handschriften und Druckwerken. Mit der Sammlung alter obsoleter Droguen und Arzneistoffe war ein guter Anfang gemacht worden. Alle diese Anfänge waren indess in ihren Theilen lückenhaft und der Vervollständigung bedürftig. Leider liefen aber die Beiträge und Spenden für das Unternehmen von den Freunden und Gönnern desselben in den letzten Jahren immer spärlicher ein. Das Jahrzehent, für welches der Apothekerverein dem pharmaceutischen Central-Museum einen jährlichen Zuschuss von 500 M. bewilligt hatte, war vorüber. Das an den deutschen Apothekerverein gerichtete Gesuch um Gewährung eines weiteren regelmässigen Jahresbeitrages kam nicht einmal an die Generalversammlung desselben und war völlig erfolglos. So waren die Aussichten für die Weiterentwicklung der pharmaceutischen Sammlung im Anfang vorigen Jahres trübe und unerfreulich.

Mit Freuden wurde es daher von den Leitern des German. Museums begrüsst, als aus pharmaceutischen Kreisen heraus vor Jahresfrist die Anregung gegeben wurde zur Bildung eines Comité's, dessen Aufgabe es sein sollte, die Ziele und Aufgaben des pharmaceutischen Museums zu fördern und zu unterstützen. Zahlreiche Vertreter des Apothekerstandes und der Chemie, unter diesen nicht wenige wissenschaftliche Kapazitäten, fanden sich darnach zusammen und erliessen einen Aufruf, der um Gewährung der Mittel zur Durchführung des für das pharmaceutische Museum seiner Zeit aufgestellten Programmes bat. Nicht nur aus Deutschland und Oesterreich, sondern auch von vielen Vertretern der deutschen Pharmacie und Chemie im Auslande wurden daraufhin theils Beiträge auf die Dauer von 10 Jahren, theils einmalige Spenden bewilligt.

Wenn die bis jetzt zusammengeflossenen Geldmittel auch noch keineswegs genügen, um das aufgestellte Programm völlig durchzuführen, so konnte mit denselben an der gestellten Aufgabe nun doch rüstig und kräftig weiter gearbeitet werden.

Schon seit längerer Zeit war für die Ergänzung des Museums das Augenwerk auf die Erwerbung verschiedener, als verkäuflich bekannter, historisch-pharmaceutischer Sammlungen gerichtet. Am werthvollsten von diesen erschienen für die Weiterentwicklung des Unternehmens die zahlreichen, aus der Vorzeit erhalten gebliebenen pharmaceutischen Denkmäler, welche die Stern-Apotheke in Nürnberg besass. Da der neue Besitzer dieser Apotheke für diese kulturgeschichtlich und für das pharmaceutische Central-Museum höchst werthvollen Gegenstände in entgegenkommender Weise gegen früher einen mässigeren und eher annehmbaren Preis stellte, so ging dieser reiche Schatz, den keine andere Apotheke mehr zu bieten vermochte, am Ende vorigen Jahres in den Besitz des Germanischen-Museums über. Dieser Ankauf war für die Entwicklung aller Theile des historisch-pharmaceutischen Museums von hoher Bedeutung. Die erworbenen Gegenstände stammen grösstentheils aus der Zeit vom sechzehnten bis achtzehnten Jahrhundert. Sie haben vor andern käuflichen pharmaceutischen Alterthümern den grossen Vorzug, dass sie sich niemals in den Händen von Zwischenhändlern befanden. Man hat daher nicht zu befürchten, dass an ihnen Fälschungen begangen sind, und weiss bestimmt, dass sie wirklich aus einer alten deutschen Apotheke herrühren. Schon der Apotheker Albrecht Pfister, welcher bei der Herausgabe des im Jahre 1546 in Druck erschienenen Dispensatoriums des damals bereits gestorbenen Valerius Cordus mitarbeitete, war Besitzer dieser in der Bindergasse zu Nürnberg gelegenen Apotheke.

Eine besonders grosse Bereicherung an höchst interessanten Gegenständen lieferte der abgeschlossene Kauf für das historische Laboratorium. Die Aufstellung in demselben mussten desswegen fast ganz neu geordnet werden. Die zahlreichen Koch- und Destilliergeräthe von Kupfer, Messing und Zinn, welche jetzt in demselben zu sehen sind, stammen fast alle aus dieser neuesten Erwerbung. Die oft wunderbar geformten alten Alembicke, Retorten, Kolben, Sublimir- und Circulirgefässe u. s. w. von dunkelgrünem Glas, welche ihrer Gestalt nach aus dem 17. und 18. Jahrhundert herrühren, sind so zahlreich, dass mit denselben die Wände in dichtgedrängten Reihen bedeckt sind. Die jüngeren meist farblosen Glasgefässe der alten Chemie haben in dem Laboratorium nun nicht mehr Raum und müssen an einer andern Stelle untergebracht werden. Nicht nur vom kulturhistorischen, sondern auch vom malerischen Standpunkte aus betrachtet, macht das Laboratorium jetzt einen höchst wirkungsvollen mystischen Eindruck, von dem die meisten Besucher des German-Museums sich immer gerne für längere Zeit fesseln lassen. Wenn die Sammlungsgegenstände des Laboratoriums auch sicher vermehrt werden müssen, so blinzelt doch das ausgestopfte Krokodil, welches oben unter dem Gewölbe zwischen den beiden Rauchlöchern im Laboratorium aufgehängt ist, entschieden mit Wohlgefallen auf die vielen alchymistischen und pharmaceutischen Denkmäler der Vorzeit herab.

In dem Programm, welches bei der Begründung des historisch-pharmaceutischen Museums entworfen wurde, ist auch die Aufstellung einer alten Materialkammer vorgesehen. In dieser sollten alle Stoffe, welche in deutschen Landen in der Vergangenheit als abergläubische oder wirksame Arzneimittel gedient haben, angesammelt werden, so dass dadurch eine historische Droguensammlung entstände. Wie vorhin schon gesagt, sind gute Anfänge zu letzteren bereits gemacht. Bislang fehlten indessen noch ganz die alten Einrichtungsgegenstände für die historische Materialkammer. Aus der Sternapotheke haben wir jetzt nicht nur eine ganze Einrichtung für letztere, sondern auch eine solche für eine Kräuterkammer erworben. Die für die Aufstellung beider erforderlichen Räume werden in nächster Zeit neben der Apotheke, und zwar die Kräuterkammer über der Materialkammer neu erbaut werden. Die Einrichtung der Kräuterkammer stammt vom Jahre 1728 und macht dadurch einen eigenartigen Eindruck, dass jede einzelne Schublade in den Regalen unter der alten bandförmigen Signatur eine in Oel gemalte Landschaft aus der Umgegend von Nürnberg darbietet. In der Materialkammer fällt ein höchst werthvoller, mit besonderer Eleganz im Barockstyl gefertigter alter Arzneischrank von 7 Meter Länge und 4

Meter Höhe in's Auge. Zwischen den mächtigen, gewundenen, reich vergoldeten Säulen desselben befinden sich Thüren, welche mit runden in Blei gefassten Scheiben verglast sind.

Auch die Offizin erhielt zur Ergänzung aus der Sternapotheke viele pharmaceutische Utensilien und insbesondere eine höchst werthvolle Reihe schön bemalter Majolikatöpfe, welche aus dem 16. Jahrhundert stammen und italienisches Fabrikat zu sein scheinen. Unter der Stuckdecke der Apotheke fällt eine mit goldener Barockumrahmung versehene Tafel auf, welche die für Pharmaceuten zu beherzigende Inschrift trägt:

> "Stell jedes an den Ort,
> Wohin sich's füglich schicket,
> Und siehe fleissig zu,
> Dass es nicht werd verrücket."

Auf der Rückseite der Tafel findet sich die lateinische Uebersetzung dieser Mahnung:

> "Ordine cuncta loces
> Atque ordene singula serves,
> Omnibus et rebus
> Proprius esto locus.

Auch diese Tafel erfüllte früher ihren Beruf in der Sternapotheke. An Kunstgegenständen fanden sich bei dem Kaufe zwei ungefähr einen Meter hohe geschnitzte und bunt bemalte Holzfiguren. Dieselben sollen die Erfinder des Mithridates und des Theriaks, also Mithridates Eupator und den Leibarzt des Nero, Andromachos, vorstellen. Zwei andere Holzfiguren in liegender Stellung; welche sichtlich aus dem Anfange des 16. Jahrhunderts stammen, stellen die allheilende Panacea, die eine der vier Töchter des Aesculap, und den Achilles vor. Jene war bei den Griechen die Verkörperung der allgemeinen Heilkunst, Achilles dagegen die Personifikation der Chirurgie. Bekanntlich erlernte der letztere die Heilkunst von dem Centauren Cheiron,

> "Dem Arzt, der jede Pflanze nennt,
> Die Wurzeln bis in's Tiefste kennt."

Als Achilles aus Versehen den Telephus, den König der Myser verwundet hatte, stillte er das Blut und heilte er die Wunde dadurch, dass er den Rost vom Speere mit dem Schwerte auf die Wunde schabte. Hiernach galt Achilles als Erfinder der Wundheilkunst. —

Es ist bei dem zur Verfügung stehenden Raume nicht möglich, auf alle Einzelheiten der neuesten Erwerbung einzugehen; diese kurze Skizze wird indessen auch so wohl schon ahnen lassen, dass durch diesen jüngsten Ankauf das pharmaceutische Central-Museum in seiner Weiterentwicklung sehr gefördert worden ist. Leider sind die Geldmittel durch diesen ausserordentlich wichtigen Ankauf und den nothwendigen Bau der Material- und Kräuterkammern nun wieder sehr erschöpft. Hoffentlich finden sich Freunde und Gönner der Sache, welche durch ihre Beihilfe eine weitere Förderung des Unternehmens ermöglichen. Mögen sie des Goethe'schen Wortes gedenken:

> "Wer nicht von dreitausend Jahren
> Sich weiss Rechenschaft zu geben,
> Bleibt im Dunkeln, unerfahren,
> Mag von Tag zu Tage leben."

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* Verehrliche Redaktion!

Anbei senden wir Ihnen als Manuscript einen Artikel über die Fortschritte, welche unsere pharmaceutische Abtheilung in der letzten Zeit gemacht hat, zu gefälliger Benützung für Ihr geschätztes Journal.

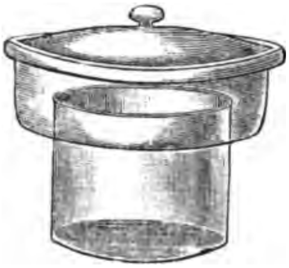
Wir bemerken dazu, dass derselbe zu gleicher Zeit den übrigen pharmaceutischen Fachblättern und Nürnberger Zeitungen zugeht. Hochachtungsvollst,

Germanisches Nationalmuseum:
Nürnberg, den 15. Febr. 1896, Hans Boesch, II. Direktor.

MONTHLY REVIEW.

Pharmaceutical Technique.

A New Desiccator.



Dr. **Rob. Muencke** of Berlin has introduced a new desiccator, which is constructed according to **C. Reinhardt**. The advantage claimed for this desiccator over others of similar form is that the entire body of the apparatus can be used for the reception of the substance to be dried. The desiccant occupies the trough surrounding the body of the apparatus. The cover is prevented from sliding off by the raised margin. Two sizes are constructed. The drying chamber of the smaller size is 8 x 8 cm., that of the larger size 15 x 15 cm.

Chemistry.

Estimation of Total Nitrogen in Urine.

Deniges recommends the Kjeldahl method, substituting, however, potassium oxalate for mercury. Potassium sulphate is formed, which increases the boiling point of the sulphuric acid, whereas the oxalic acid serves as a powerful reducing agent. If the foaming should become excessive upon the application of heat one to two ccm. of alcohol are added drop by drop. If the urine contains much sugar, from 5 to 10 ccm. can be added. In the rest of the process no changes are made.

[Pharm. Centrh. 37, p. 9; from Rèpert. de Pharm., 1895, p. 204.]

Distribution of Boric Acid in Nature.

Jay has examined a large number of different species of plants which had grown in a great variety of soils. As a result of his investigations he came to the conclusion that boric acid is found universally in the soil and that it is contained in all cultivated as well as wild growing plants. On the other hand animals do not absorb boric acid. If such is administered to them it is eliminated in the natural way and in a comparatively short time.

[Apoth. Ztg., 11, p. 97; from Compt. rend., 1895, No. 24.]

Reagent for Sulphuretted Hydrogen.

H. Krahl recommends the use of test paper moistened with a solution of nitro prusside of sodium to which a few drops of stronger ammonia water have been added. The test paper is placed into the mouth of the testtube or flask in which the sulphuretted hydrogen is generated. The presence of mere traces of this gas is indicated by a purple coloration of the test paper.

[Zeitsch.. d. allg. oest. Apoth, Ver., 50, p. 206.]

The Presence of Sodium in Aluminium Prepared Electrolytically.

In addition to nitrogen and carbon, which have already been shown to influence the properties and application of aluminium, Moissan has recently found sodium in aluminium prepared electrolytically. From 0.1 to 0.42 p. c. of sodium was found in different specimens. Water affects such aluminium, first slowly, but after it has become alkaline, more rapidly. The detrimental influence of the sodium is also perceptible in alloys.

[Ber. 29, Ref., p. 1; from Compt. rend., 121, p. 794.]

A Delicate Test for Albumen in Urine.

The following directions are given by A. Jolles. To 4–5 ccm. of filtered urine, acidulated with 1 ccm. of 30 p. c. acetic acid, 4 ccm. of the following reagent are added and the mixture shaken: mercuric chloride 10.0, sodium chloride 10.0, succinic acid 20.0, distilled water 500.00. To a second like quantity of urine, acidulated with a like amount of acetic acid 4 ccm. of water are added. By comparison traces of albumen in the dilution of 1:120,000 can be detected. The reagent is not applicable to urine containing iodine.

[Ber. 29, Ref., p. 144; from Z. physiol. Chem., 21, 306.]

Botany and Pharmacognosy.

Tabasheer.

Tabasheer or Tabûsheer, a white, smooth, porcelain-like deposit rarely present in the nodes of the bamboo, supposed by the natives in Trinidad and the East Indies to have valuable medicinal properties, has been found by W. H. Ince to be a rather variable composition of large quantities of silica with indefinite amounts of the oxide of iron, calcium and potassium.

[Pharm. Journ., Feb. 22, 1896, p. 141.]

Certain Citrus Fruits.

In an article on the fruits going under the name of shaddock, grape fruit and forbidden fruit, Charles H. La Wall reviews at some length the numerous and frequently contradictory references to this group of fruits and concludes that although sometimes used popularly as synonyms, they are in reality three distinct things. The forbidden fruit is a pear-shaped variety of the species *Citrus Paradisi* Macfayden, the shaddock and the grape fruit are to be regarded as different varieties of the same species, *Citrus decumana* L.

[Am. Journ. Pharm., 68, p. 121.]

Note on the Root of Rumex Nepalensis.

In a communication on rhubarb O. Hesse (Pharm. Journ., 4, 1, p. 325) had called attention to the fact that the root of *Rumex nepalensis* contains no chrysophanic acid as Hooper supposed, but substances that are in part similar to this acid. Inasmuch as A. G. Perkin (Chem. Centralbl., 1896, 1, p. 209) announced that he was going to make a study of this root O. Hesse makes the preliminary announcement that he has obtained and partly examined the following substances:

1.) $C_{15}H_{10}O_4$, isomeric with chrysophanic acid, constitutes golden yellow laminae melting at 186–188°;

2.) $C_{16}H_{12}O_4$, orange-red needles melting at 136°; and

3.) $C_{18}H_{16}O_4$, greenish-yellow prisms melting at 158°.

Of these, No. 1 dissolves in sodium carbonate solution with a yellowish-brown color; Nos. 2 and 3 are insoluble therein, but dissolve readily in caustic potash solution with purple color. No. 2 is supposed to be the monomethyl ether of the first, and No. 3 the trimethyl ether of No. 1. No positive proof, however, has thus far been brought in favor of this supposition.

[Ber. 29, p. 325.]

Preparation and Composition of Tofu.

In order to make up the deficiency of proteids in rice, the inland inhabitants of Japan utilize various leguminous seeds, especially the soja bean. Two products prepared from this bean, *miso* and *natto*, have already been described (Kellner, Tokyo Bull., 1, No. 6.) According to M. Inouye a third preparation of soja beans, tofu, is obtained by pulping the beans after soaking them for 12 hours in water, boiling with water (3 parts) for an hour and filtering through cloth; the liquid, which resembles milk in appearance, and fresh malt in taste, has a neutral or slightly acid reaction, but after several days becomes strongly acid (lactic acid), when the separation of casein takes place. In manufacturing tofu, the fresh filtrate is treated with about 2 percent of concentrated sea-water, the flocculent precipitate slowly pressed and cut into tablets; the product has the taste of milk casein. In the beans themselves, the casein is in a soluble form in combination with potassium or sodium, and is not coagulated by boiling, but is precipitated by the calcium and magnesium salts in the brine; when tofu is boiled with 1 per cent. aqueous disodium phosphate, the casein redissolves, yielding an opalescent solution, calcium phosphate being formed.

Tofu is sometimes subjected to the action of frost, when it contracts and loses a large amount of water; the product is called koridofu. The following numbers show the percentage composition of (1) the fresh milky liquid, (2) tofu (Kellner), (3) koridofu, and (4) yuba, (prepared by evaporating the soja bean extract)·—

	Water.	Proteids.	N-free extract.	Fat and lecithin.	Cellulose.	Ash.
1.	92.53	3.02	1.88	2.13	0.03	0.41
2.	89.29	4.87	4.35	....	....	0.48
3.	15.32	41.42	15.05	23.65	1.48	3.08
4.	21.85	42.60	7.65	24.6	....	2.82

The milky extract left for two weeks contained 0.092 gram of lactic acid per 100 cc. The dry tofu yielded 11.2 per cent. of lecithin. According to Osawa, tofu is as readily digested as beef.

[J. C. S., 70^{II}, p. 65; from Bull. Coll. Agric., Imp. Univ. Tokyo, 2, p. 209.]

The Antiquity of Wheat.

In a recent work on prehistoric botany, by Georg Buschan, reviewed by Dr. Karl Müller, some interesting features are brought forward. The author, in agreement with earlier writers on the subject, regards wheat as the cereal oldest in cultivation. Thousands of years before our era it was distributed not only over the older civilized lands of Asia —Mesapotamia, Babylonia, China, India, and of Africa — Egypt — but also over a great part of Europe. The pictorial and written evidences from Egypt reach back into the third century B. C. and show us that wheat was then the staple bread-stuff and was, therefore, cultivated on a large scale. Also in Palestine, evidences of wheat cultivation are found pointing back to the most ancient times. The Pentateuch is held to assert that it was a land fruitful in grains. Many other citations from the Old Testament are taken to refer to wheat and wheat-raising. Evidences tend to show that wheat was cultivated in the neolithic period, a time at which man had already begun to cultivate the soil. Toward the close of this period, European wheat-fields were not confined to the coasts of the Mediterranean but stretched northward to the Alps. The beginning of the history of the classic peoples found wheat among them and the Homeric Greeks knew two kinds: the common wheat and the spelt.

The author gives considerable attention to the question of the identification of these ancient types and their bearing as evidence on the problems of race migration. [Die Natur., 44, 5. 531.]

Essential Oils of Black and White Peppermint.

Peppermint has been cultivated in the district of Mitcham, England for about 150 years. The two varieties of the plant, *Mentha piperita*, grown about Mitcham are known as black and white peppermint respectively, the black mint occupying the greater part of the acreage of cultivation. The preference given by growers to the black is based chiefly upon the fact that the plant is more hardy than the white variety, and the yield of essential oil is considerably greater.

Although dealers are of the opinion that the difference between the oils of the two varieties is more imaginary than real, and in spite of the fact that the cultivation of white peppermint has largely been discontinued, there continues a constant demand for certain purposes for oil of white peppermint, notwithstanding its value is considerably higher than that of the black mint oil.

Mr. John C. Umney has recently made a chemical examination of both varieties of oil and finds that the white oil has a greater optical activity (—33° against — 25.5° for the black), that it does not deposit menthol at a low temperature but contains a greater proportion of menthyl esters (13.6 p. c. against 3.7 p. c. for the black.) [Pharm. Journ., 1896, p. 123.]

Practical Pharmacy.

Preparations from Animal Organs.

Cerebrum exsiccatum pulv., made from the brain of calves, is employed by English and American physicians in *neurasthenia*. The *liquor cerebri sterilisatus*, prepared from the fresh brain (gray matter), is administered subcutaneously. Preparations known in England under the names cerebrin alpha or *cerebrinin* were tried by Ryan and Montagnon in *chorea*, and by Vetlesen in *neurasthenia* with good effects, while they were of little use in the cure of feeble-minded persons.

Glandulae suprarenales sicc. pulv., prepared from the suprarenal glands of cattle and sheep (one part of the dried gland corresponding to about five parts of the fresh organ), according to Oliver, Schäfer, Moore and Nobarro, causes a contraction of the arteries with corresponding increase of blood pressure, while also exerting a tonic influence on the heart. Since the preparation is not destroyed by pepsin in dilute acid solutions, it can be administered through the mouth. In *morbus Addisonii* the result was astonishing. A case of *diabetes insipidus* was much improved, and Oliver claims that a good effect is experienced in all cases depending upon a loss of vasomotor tone; e. g., *menopausis, neurasthenia, cyclic albuminaria, diabetes mellitus* and *insipidus, morbus Basedowii*, and diseases of the heart. Given in powder or tablet form, 0.2 g., 2—3 times daily, one hour after meals.

Hypophysis cerebri sicc. pulv. and tablets, from the pituitary gland of freshly killed cattle, were used by Marinesco in three cases of pronounced *acromegalia* (enlargement of the body extremities, colossal growth of the limbs from thickening of the bones). Though it was impossible to decrease the size of the extremities, the headache and neuralgic pains were diminished and an increased diuresis observed.

Medulla ossium rubra sicc. pulv. The red marrow of bones is now recognized by physiologists as the seat of formation of the red blood corpuscles, and that of cattle is employed to stimulate blood formation. Frazer, Barrs, Drummond and Billings have worked with positive success. Barr cured a difficult case of pernicious *anaemia*, that had been rendered worse by treatment with arsenic. Combe obtained improvement and sometimes cures in *chloranaemia, rachitis*, and *anaemia pseudoleucania infantum*. The dried marrow is given in tablet-form, in doses of 0.2 g.

Ovariinum siccatum pulv. and tablets are prepared from the ovaries of cows, and clinical experiments are now in progress.

Prostata sicc. pulv. and tablets, prepared from the prostate glands of steers. E. Reinert at the XIII congress for internal medicine at Munich, reported concerning experiments with this new remedy in *prostate hypertrophy;* he prescribed at first ¼, later ½ of a gland, chopped fine and eaten with bread, twice or three times a week. After several weeks treatment, a decided decrease in the size of the organ occured; at the same time, improvement in general health and decrease of strangury. Unfavorable secondary effects were not observed; the urine remains free from sugar and albumen. The permanent preparation put up by Merck in tablet-form contains 0.1 g. of the dried gland-substance; dose, 5 tablets daily, administered in two doses.

Renes siccati pulv. is prepared from the kidneys of sheep and hogs. Schiperowitsch prescribed fresh kidneys and the dried extract with 35 nephritic patients; diuresis increased in spite of a meat diet, and the albumen decreased or disappeared entirely from the urine. In cases of shrunken kidneys, *polyuria* diminished and the general health improved; uraemic symptoms disappeared also. Donovan secured similar results in *nephritis* accompanied by general *anasarca* (dropsy of the skin).

Thymus sicc. pulv. and tablets, prepared from the fresh thymus gland of calves and sheep. J. Miculicz has instituted investigations as to whether this gland could not be substituted for the thyroid gland in the treatment of goitre, and found his theory verified. A case of goitre and one of *morbus Basedowii* were very favorably influenced, the only difference being that in the treatment with thymus, neither heart-disturbances nor loss of weight occurred. There was employed five to six times the quantity used with thyroid. In cases of increased uric acid formation, the use of thymus must be avoided, as it increases the quantity of this substance formed and eliminated. Daily dose: 12—15 tablets containing each 0.05 g. of the dried substance, corresponding to 0.3 g. of the fresh gland.

Thyreoidinum siccatum, according to experiments, is indicated in a large number of diseases. Worthy of mention are the curing effects in skin diseases; Stieglitz noticed the disappearance of nail deformities and of circumscribed *sclerodermа*; J. W. White, of hypertropic scars; W. Scatchord treated *pityriasis rubra* with good results; A. Nobbs and others, *ichthyosis*; Byron, Brommel, and Abraham, *lupus*. Though used several times in *psoriasis* without any effect, in other cases favorable results were noted. Jonin found thyroidin very beneficial in *fibroma* of the uterus, Meltzer used it in sporadic *cretinism*; Gouladse in *syphilis*, and Morin in incipient *tuberculosis*. Besides being the best remedy against corpulency, it seems to have a beneficial action in *morbus Basedowii*.

Thyreoidinum depuratum is prepared by Merck after a process discovered by Dr. Notkin of Kiew. According to Notkin, two physiologically active albuminous substances are contained in the normal thyroid gland, thyroproteid and thyroidin. Thyroproteid, in dry condition, consists of transparent lamellae, and is a homogeneous substance which, when introduced into the animal organism, produces an acute poisoning in which depression symptoms are most prominent. The thyreoidinum depuratum consists of at least two albuminous bodies, of which one shows the properties of globuline while the other, the physiologically more important one, has the nature of an enzyme. It forms a pale yellow, adhesive. hygroscopic powder of much greater poisonous action than thyroproteid, stimulation being very pronounced. Thyroproteid is a product of tissue-changes; thyroidin, a specific product of the thyroid cells, which acts as an enzyme upon the former, changing it and rendering it harmless. When the function of the gland ceases (through extirpation), acute poisoning results from the accumulation of thyroproteid; if the gland dies through atrophy, the well-known picture of *myxodem* is the result. Thyroidin is not attacked by pepsin-hydrochloric acid, which fact explains its action, when given internally, of decomposing or neutralizing the thyroproteid. Thyroidinum depuratum is readily soluble in water and can be administered in liquid (subcutaneously), as well as in solid form. Notkin uses the following:

Internally,
℞. Thyreoidinum dep., 0.25 g.
Kaolini 3.0 g.
Vanillini 0.01 g.
Muc. Tragac. q. s. ut f. pil. No. XXV.
S. One to two pills daily.

Subcutaneously,
℞. Thyreoidinum dep.. 0.05 g.
Aq. dest., 10.0 g.
S. One pravaz-syringe full daily.

To prevent decomposition, carbolic acid (0.02 g.) or 1 drop of chloroform should be added to the above.

The manufacture of the above preparations must be undertaken with the greatest care; only the organs of perfectly healthy animals, freshly killed, should be used. Especially in the case of thyroidin, Merck recommends keeping in rooms protected from heat, moisture, light, and air.

Food Stuffs.

The Value of Skimmed Milk as a Food.

It is claimed that in European countries bread constitutes about three-fourths of all solid foods. Bread alone, however, is not sufficient for satisfactory nutrition, fat and albumen being wanting. Inasmuch as albumen is the most expensive of all food stuffs, a reasonable increase in the amount of albumen in food, without a material increase in the price of the latter, is therefore of considerable economic importance. Such a means is to be had in the use of skimmed milk in the place of water in the manufacture of bread. If bread is so made that 100 parts of flour yield 120 p. bread 0.65 liter of skimmed milk should be used for every kilo of flour. One kilo of bread will therefore contain the valuable constituents of ½ liter of skimmed milk. Bread thus prepared will then contain 1.75 grams albumen and 24 grams milksugar more to the kilo than when prepared with water.

In order to ascertain whether this extra food in the bread is made use of by the digestive tract H. Rechsteiner and W. Spring for three days experimented upon themselves. The loss of dried substance varied from 2.95 to 3.84 p. c., the loss of fat from 1.41 to 3.3 p. c. that of albumen 5.93 to 11.18 p. c. It thus becomes apparent that very good use is made of the food value of skimmed milk.

[Pharm. Centrh., 37, p. 7; from Milchztg. 1895, p. 814.]

Physiology, Pharmacology and Therapy.

Animal Life without Bacteria in the Digestive Tract.

In order to disprove Pasteur's view that animal life without intestinal bacteria is impossible Nuttall and Thierfelder raised guinea pigs, which had been born by means of the Caesarean section, in a sterilized chamber with sterilized air and food. In an ingeniously constructed apparatus (see original) these animals were fed hourly with undiluted sterilized cows' milk. One such experiment was carried through a period of eight days. The animals were then killed and the microscopical examination of the intestinal contents revealed the absence of bacteria. Cultures from the large and small intestines also gave negative results.

[Ber. 29, Ref., p. 45; Z. physiol. Chem., 21, p. 109.]

Immunity of Lower Organisms against Leadpoisoning.

In a pile of decaying bark mixed with refuse of a whitelead factory numerous lower organisms, among them earth-worms, *Lumbrinus minor*, were found. They all contained lead. The decaying mass of bark contained 1.5 to 2.5 p. c. lead oxide. Examinations that have been carried on by T. W. Hogg since 1884 revealed the presence of 1.75 to 2.60 p. c. of lead oxide in the dry substance of the worms, equivalent to 0.35 to 0.52 p. c. of the living weight of the worms.

[Ber. 29, Ref., p. 49; from Chem. News, 71, p. 223.]

Gaseous Fermentation in the Human Stomach.

E. Wissel has analyzed according to Hoppe-Seyler's method the gases obtained from the stomachs of six persons suffering from various diseases. The gases of the stomach were always found mixed with atmospheric air. He found O, N, CO_2 and H, the latter two always in large quantities. The ratio of CO_2 and H was approximately 1:1; as a rule however there was more hydrogen. The largest amount of CO_2 and H was found about four hours after meals. By washing the stomach, especially with sodium bicarbonate solution, the amount of gases was diminished.

[Ber. 29, Ref., p. 49; from Z. physiol. Chem., 21, p. 234.]

Iodates in Medicine.

1. Silver iodate is used internally in doses of 0.005—0.01 gm. as an intestinal astringent, and is prescribed for acute diarrhœa and chronic catarrh of intestines. It does not interfere with the functions of the stomach. Administered in pills the same as the iodates of mercury, zinc and strontium.

2. Lithium iodate is administered subcutaneously (0.1%) in kidney colic; in cases of chronic gout 0.15—0.2 gm. internally.

3. Mercuric iodate is easily soluble in solutions of potassium iodide, the solution being clear and quite stable. (Dist. water 10.0 gms., mercuric iodate 0.115 gm., and potassium iodide 0.08 gm.; to be used subcutaneously.)

4. Quinine iodate is used in doses of 0.05—0.10 gm. as a nerve tonic and antineuralgic; it is soluble in water.

5. Strychnine iodate. Doses of 0.006 gm. should not be exceeded.

6. Codeine iodate is more active than any other salt of this alkaloid, and can be used as a substitute for morphine without producing constipation. Dose, 0.03—0.05 gm.

7. Hyoscine iodate is twice or three times as active as any other hyoscine salts. Prescribed in iritis and keratitis as a mydriatic. Maximum dose, 0.5 m. gm.; subcutaneously 0.1—0.15 m. gm. Action is prompt in 0.05—0.07% solutions.

8. Atropine iodate. Its solution remains germ-free for a long time, and does not require sterilization nor the addition of antiseptics. These latter two remedies act more rapidly than any other mydriatics but their effects are less lasting.

[Therap. C. Bl.; Ph. Post, 1895, p. 537.]

Action of Carbonic Oxide on Man.

The experiments made by the author, John S. Haldam on himself show that the symptoms caused by carbonic oxide depend on the extent to which the hæmoglobin has been saturated; the percentage saturation of the hæmaglobin of the red corpuscles may be estimated during life by a simple colorimetric method. Carbonic oxide is a "cumulative" poison. The symptoms do not become sensible during rest until the corpuscles are about one-third saturated; with half saturation, the symptoms (respiratory distress, headache, etc.) become urgent. Similar experiences are experienced by mountaineers at high altitudes.

When air containing this gas is breathed, about half of that actually inhaled is absorbed, except when absorption is coming to a standstill. The time required for the production of sensible symptoms in an adult depends on the time required for the inhalation of about 660 cc., or the absorption of about 330 cc. of the pure gas; this time in different animals varies with the respiratory exchange per unit of body weight, and is about 20 times as long in a man as in a mouse; hence a mouse can be used as an indicator in a coal mine before men penetrate into it.

The maximum amount of carbonic oxide capable of being absorbed by the blood from air containing a given small percentage depends on the relative affinities of oxygen and carbonic oxide for hæmoglobin, and the relative tension of the two gases in arterial blood. The affinity of carbonic oxide for hæmoglobin is about 140 times that of oxygen, and the oxygen tension of human arterial blood is approximately, 16 per cent. of an atmosphere. Distinct symptoms, appreciable during rest, are not produced until about 0.05 per cent. of the gas is present; with about 0.2 per cent. urgent symptoms are produced. With a given percentage of carbonic oxide in air, a certain percentage saturation of the blood is reached within about 150 minutes, and is not afterwards exceeded, however long the breathing of the vitiated air is continued. The disappearance of the gas from the blood when fresh air is again breathed is always much slower than the absorption of the gas, and is chiefly due to dissociation of carbonylhæmoglobin by the mass influence of the oxygen in the pulmonary capillaries, and consequent diffusion of the gas outwards through the alveolar epithelium.

[J. C. S., 70II, p. 52; from J. Physiol., 18, p. 430.]

Ferratin: Iron Tonic and Food.

Many of the numerous preparations of iron when administered are not readily absorbed, or are rendered worthless by the changes which they undergo through the action of the hydrochloric acid in the stomach and the sulphuretted hydrogen in the intestinal tract. According to Bunge these inorganic iron preparations are solely of use in combatting and neutralizing the hydrogen sulphide present in the alimentary canal; the hæmoglobin present in the red blood corpuscles deriving its iron constituents from the organically combined iron in food.

Prof. Schmiedeberg, in 1893, after extended experimentation, contributed an article on the dietetic and therapeutic uses of an artificially prepared iron compound which he termed Ferratin. It is a rusty colored fine powder not unlike oxide of iron. This iron compound he extracted from the pig's liver and it is looked upon by him as the natural form in which iron is taken with the food. It is claimed that it is easily absorbed, does not cause constipation, headache or gastic irritation even after prolonged use, as is confirmed by Germain Sée and others, greatly in contrast with the ordinarily used inorganic iron compounds. The therapeutic importance of ferratin is based upon the fact that after its absorption it is stored up in the liver and is immediately available for use, while all other compounds and simple albuminoids, after their slow and difficult absorption, are stated to undergo a change into ferratin before they are active agents for supplying the organism with the amount of natural iron which it requires to maintain all vital functions of nutrition and growth.

In the past two years numerous experiments with ferratin have been made. Dr. J. S. Perckhan has recently reported on his experience with ferratin and comes to the conclusion that "ferratin" can be safely recommended as a hæmatinic remedy, but suitable diet, hygiene and exercise are not to be neglected.

On the Normal Occurence of Iodine in the Animal Body.

E. Baumann has prepared from the thyroid gland a compound called thyroiodin, which contains iodin in organic combination. Roos has demonstrated the efficacy of this preparation when administered to man or dogs. If the preparation contained but little iodin, the effect was accordingly slight: if iodin was absent, no effect whatever was produced. The ash after being treated with soda and saltpeter showed as much as 9.30 p. c. iodin. The thyroidal gland of man also contains iodin. Small quantities of this element were also found in colloidal scrofula. The thyroid gland of pig contains but little iodin. The presence of iodin is determined in the following manner: 26–30 g. of thyroid gland from sheep, from which most of the fat has been carefully removed, are boiled with 100 ccm. of 10 p. c. sulphuric acid for from 4–8 hours in a flask connected with a reflux condenser until almost all has gone into solution. The solution is cooled with ice water and filtered. Any fat that floats on the surface is removed. The brown-colored precipitate is washed with water, suspended with the filter in 250 ccm. alcohol of 85 p. c. and extracted two or three times with boiling alcohol. The alcoholic extracts are evaporated to dryness. The residue is brought into a silver crucible, a small amount of soda and a few drops of water are added and the mixture heated to a low redness. The fused mass is dissolved in water, after cooling acidulated with concentrated nitric acid and shaken with 3–6 ccm. of chloroform.

[Ber. 29, R., p. 144; from Z. physiol. Chem., 21, 319.]

Scientific Societies.

The Hundreth Anniversary of the first Vaccination by Jenner.

In honor of the hundreth anniversary of the first vaccination against small pox by means of cow's lymph by Jenner, the Russian Hygienic Society will publish a Russian edition of his treatise on vaccination, inaugurate an exposition of vaccination and establish a prize of 1000 rubles and a gold medal for the best treatise on vaccination. This treatise can be written in the Russian, German, French or English language.

Inasmuch as some confusion seems to exist in some pharmaceutical journals about the character of the anniversary it may not be amiss to state that Edward Jenner was born May 17th, 1749 in Berkeley. In 1796 he vaccinated with cow's lymph as a protection against small pox. In 1798 he wrote: Inquiry into the causes and effects of variolæ vaccinæ. He died in Berkeley Jan. 26, 1823.

Universities and Colleges.

Prof. J. H. van t'Hoff.

The well known Dutch chemist, Prof. J. H. van t'Hoff in Amsterdam, who a year ago was elected foreign member of the Prussian Academy of Science, has now received an invitation from the academy to come to Berlin. He is to fill the place of the late Prof. A. W. von Hofmann as chemist of the academy, but not as professor of chemistry at the University of Berlin, which position is now held by Prof. E. Fischer. A laboratory is to be erected for Prof. van t'Hoff, in which he can give all of his time to research. As member of the academy he also has the priviledge of giving a course of lectures at the university. Prof. van t'Hoff is only forty-four years old and has for a long time been counted among scholars of international fame. His name is generally associated by chemical students with the theory of the assymmetric carbon atom. No less important, however, is his theory of osmotic pressure, which has greatly assisted in establishing the modern theory of solution.

Secondary Pharmaceutical Education in England.

The Burroughs' Memorial Scholarship constitutes a not unimportant addition to the facilities afforded to British pharmaceutical students, who wish to extend their scientific training beyond what is strictly necessary for the due performance of their professional duties as pharmacists. For many years the Jacob Bell Memorial Scholarships were the only pharmaceutical scholarships that existed in this country, and the funds available in connection therewith have always been devoted exclusively to primary technical education. The Redwood Scholarship was founded on similar lines, but has since been diverted to the purposes of secondary education, and the Manchester Pharmaceutical Association Scholarship funds have been similarly employed, for, although intended for elementary students, no candidate has yet been successful in gaining the Scholarship. The Burroughs' Memorial Scholarship is likewise intended to encourage the extension of secondary education, and will, on account of its pecuniary value, be the most important in that connection. It is gratifying to observe that so many friends of pharmacy, while anxious to perpetuate the memory of deceased masters and friends, should find the best outlet for their sympathy with the work of the past in making fitting provision for elevating the position of the craft in the future.

[Pharm. Journ., 1896, p. 132.]

The First Lady Pharmacists in Hungary and Italy.

Mrs. Serena Varságh, the wife of an apothecary in Budakerz, who possesses the necessary secondary education has applied for admission to the University of Budapest. The assistants' examination, however, must be passed before a candidate can be admitted to the university, and there appears to be no published record of such event.

According to the Bolletino chimico-pharmaceut., Dorina Crespi Andina, the wife of the apothecary Leopoldo Crespi in Trecate, has passed the assistant's examination *cum honore* at the University of Genoa. The event has attracted considerable attention not only in Italy but also in other European countries. Americans have every reason to be somewhat amused at the seriousness with which many European pharmacists view such innovations of their realm by the other sex.

University of Pennsylvania.

A committee on medical and allied schools of the board of trustees of the University of Pennsylvania has under consideration a proposition providing for the gradual elevation of the requirements for entrance upon the course of study in the medical department, until in 1899 they shall be equal to those of the collegiate department. At a later date it is possible that a collegiate degree will also be made a requisite.

Central Tennessee College.

The graduating exercises of the Meharry Medical, Dental and Pharmaceutical Departments held commencement Feb. 4, at Nashville. The class consisted of twenty colored graduates: eleven from the Medical, three from the Dental and six from the Pharmaceutical Department. Of the last number one was a woman. It was the seventh anniversary of the Pharmaceutical Department, the others being older. The college is said to do excellent work for the colored people in all its departments. It certainly speaks well for a college that in the face of only six graduates in the Pharmacy Departments, has the courage to raise the requirements to those of a three years course, even if the year is not equivalent to the collegiate year generally.

Literary.

Books and Pamphlets Received.

Wilhelm Engelmann—Leipzig. Die Vegetation der Erde. Sammlung Pflanzen geographischer Monographien. Herausgegeben von A. Engler und O. Drude. Bd. 1: Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel. Von Prof. Dr. Moritz Willkomm. 1 gr. Octav Bd. Mit 2 Karten, 2 Heliogravüren und 21 Textabbildungen. 1886. M. 12.00.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Abbildungen. XI. Abtheilung. Bd. III., pp. 1—160. Calciumoxyd bis Dampfkessel. 1895. M. 5.00.

Wilhelm Braumüller—Wien. Handwörterbuch der Pharmacie. Herausgegeben von A. Brestowski. 24. (Schluss-) Lieferung, pp. 865—942. Zucker-zymotische Krankheiten. Nachtrag und Sach-Register. 1885. M. 2.40.

Merck & Co.—New York. Merck's 1896 Index. An Encyclopedia for the Physician and the Pharmacist. One vol. pp. 8, 268. 1896. $3.00.

Author.—Die oblita-schizogenen Secretbehälter der Myrtaceen. Inaugural-Dissertation zur Erlangung der philosophischen Doctorwürde vorgelegt der hohen philosophischen Facultät der Universität Bern. Von Gotthilf Lutz, Apotheker aus Winterthur. Mit 2 Tafeln. Brochüre. pp. 39. 1895.

Author—Oakland, Cal. Handbook of West-American Cone-Bearers. By J. G. Lemmon, Botanist California State Board Forestry. 1895. $1.00.

Author.—Untersuchung über die Sekrete, mitgetheilt von A. Tschirch. 16 Beiträge zur mikroskopischen Kenntniss des Opiums. Von Dr. Mjöen. Brochüre. pp. 35.

Lehn & Fink—New York. Diphteria Antitoxin and other Biological Products. From the biological and vaccinal department of the New York Pasteur Institute. Pamphlet. pp. 34. With several half-tone illustrations. 1896.

Author.—Anti-diphteritic Serum and Loeffler's Solution. With a report of twenty-six cases. By B. R. Shurly, B. S., M. D., House Physician to Harper Hospital, Detroit, Mich. Pamphlet. pp. 15. 1896.

Chemische Fabrik "Rhenania"—Aachen. The Properties and Uses of Nosophene, Antinosine and Endoxine, three new iodine compounds for external antisepsis. Pamphlet. pp. 8. 1890.

Author.—Was ist eigentlich Pharmacognosie? Prolegomena zur modernen Drogenkunde. Von Dr. A. Tschirch. Brochüre. pp. 12. 1896.

Reviews.

Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Prof. Dr. Otto Lueger im Verein, mit Fachgenossen. Mit zahlreichen Abbildungen. Zweiter Band. Ballistisches Problem bis Calcium karbonat. Deutsche Verlags-Anstalt, Stuttgart, 1895. M. 25.00.

With the completion of the second volume of this work the reader is in better position to judge the scope and value of the same. Although designed especially for technical students it is of such a general character as to be of great interest to every intelligent reader. Even the pharmacist will find many articles of special interest to him, particularly those on chemical and sanitary subjects. The manufacturing pharmacist will find many illustrated articles on technical subjects that will appeal to him. The work is richly illustrated and the editor is assisted by not less than 120 colaborers.

The pharmacist like the general reader cannot well afford a library of exhaustive treatises on a large variety of subjects. Yet he cannot afford to remain totally ignorant in departments not strictly his own. A good technical encyclopoedia will no doubt prove of great value to the progressive pharmacist as well as to the general reader. Inasmuch as the work before us contains many illustrated articles on chemical technology, sanitation and hygiene it will be found especially serviceable to the pharmacist who naturally desires information on these subjects.

Aside from a large number of smaller articles on chemical subjects, those on baryum, lead (*Blei*), boron and bromine and their numerous derivations deserve special mention. Longer articles in the field of chemical technology are those on the Bessemer process, beer-brewing (*Bierbrauerei*), burners (*Brenner*) and fuels (*Brennstoffe*). Physical and physico-technical articles of special interest are those on the barometer and its application, electrical illumination (*Beleuchtung, elektrische*) and arc lights (*Bogenlampen*). Other articles on technical subjects that are well illustrated are those on the manufacture of tin and tin-implements (*Blechbearbeitung*) and of barrels (*Boettcherei*), the block system, arches and arched bridges (*Bogen und Bogenbrücken*) and book binding. Articles of an architectural character are those on library (*Bibliothek*), castle (*Burg*) and Byzantine architecture.

Articles on sanitation and hygiene and allied subjects are well represented in this volumn: *Bedürfnissanstalten, Berieselung mit städtischem Kanalwasser, Bewässerungssystem* and *Brunnen* will prove of particular value to persons interested in public sanitation. Other articles of like interest are those on soils (*Bodenarten*), the chemistry and physics of soils (*Bodenchemie* and *Bodenphysik*), the manufacture of bread (*Brotfabrikation*) and on wells (*Brunnen*).

The wide scope and general interest of the work thus becomes apparent. Even the sportsman will find the articles on *Besegelung, Boots bau* and *Bojen* contained in this volumn of special interest. This work gives prominence to such subjects as are usually considered in a secondary manner in general cyclopoedias and therefore admirably supplements these.

The paper is claimed to be free from wood fibre, the type is clear and the illustrations are on the whole very good. In using this work for ready reference some difficulty will be encountered in knowing just where to look for the desired information. It is to be hoped that the publishers will make this otherwise excellent work more valuable, especially for ready reference by furnishing a complete index to the work when finished.

E. K.

Einleitung in das Studium der Chemie. Von Dr. Ira Remsen, Professor der Chemie an der Johns Hopkins Universität in Baltimore. Autorisirte deutsche Ausgabe. Bearbeitet von Dr. Karl Seubert, a. o. Professor der Chemie an der Universität Tübingen. Zweite Auflage. Verlag der H. Laupp'schen Buchhandlung. Ein Bd., pp. XVI, 474. 1895. M. 6.00.

Prof. Remsen's text-books are widely and favorably known in this country and need no introduction to American students of chemistry. The fact however, that they should be translated into German and that a German translation should find its way back to America may create some surprise. German scientists are so well known as bookwriters that the translation of an American elementary text-book into German may justly call for an explanation for the sake of those who are not familiar with the situation. The fact that the book is an elementary one furnishes the explanation. The German language abounds in admirable text- and reference books of an advanced character. Neither is there a dearth of elementary text books, but these are ofttimes only guides or even mere skeletons. The competent teacher in Germany is expected to be a living text book. He places into the hands of the popular student a rudimentary guide or skeleton and in his lectures furnishes the mental thread, the soul as well as the flesh and blood. With the absence of a sufficient number of competent teachers in the natural sciences the situation in this country is quite different.

There exist also in the German language a number of more complete elementary text-books, but as a rule they differ from Prof. Remsen's book. The former ofttimes furnish a larger array of chemical facts, whereas the latter makes these facts simply the vehicle by which right chemical thinking may be inspired. The inductive method is emyloyed and the student is expected to perform most of the experiments himself, so as to become a careful observer. The detailed descriptions and explanations make the book valuable for self-instruction, but are not intended by any means to replace the instructor.

The need of such a book is evidently felt in Germany as well as here, through probably not as keenly. The fact that a second German edition, based upon the third American edition, has made its appearance seems to be sufficient evidence. The German edition is very largely a translation of the American, but additions have been made to several chapters with the consent of the American author.

The German translation is more than a mere curiosity on this side of the Atlantic. There are a number of Germans pharmacists as well as teachers of German secondary schools and colleges to whom this translation will be of interest.

Little or nothing need be said about the details of the book, since the American edition is so well known. It may suffice to state that illustrations, paper and penwork are good and a credit to the publisher, as the book in general is to its American author and German editor.

E. K.

Die natürlichen Pflanzenfamilien, nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten, begründet von A. Engler und K. Prautl, fortgesetzt von A. Engler, Professor der Botanik an der Universität und Director des botanischen Gartens in Berlin. Lief. 126—129. Verlag von Wilhelm Engelmann in Leipzig. 1896.

The successive issues of this foremost standard work on the flora of our globe have been duly reviewed in the pages of the Rundschau during the years of their appearance. This literary production, which is the joint work of specialists and leading botanists of Germany, will remain an unrivaled standard for many years to come. When completed it will comprise five large octavo volumes, each of about a thousand or more pages. with many thousand wood cuts. In progress of publication for about six years, its paramount value has been so fully recognized in the columns of this journal as well as everywhere else that no further comment in this regard is needed.

The latest issues of the "Pflanzenfamilien" contain further parts of volume 3 (*Sabiaceæ, Melianthaceæ, Balsaminaceæ, Rhamnaceæ*) and Volume 4 (*Acanthaceæ, Myoporaceæ, Phrymaceæ, Plantaginaceæ, Verbmaceæ, Labiatæ*). The 129th issue contains the first installment of the Cryptogames, edited by Prof. A. Engler, commencing with the now so important domain of the Schizophyta. Of these the group of Schizomycetes

(Bacteria) is first treated by Prof. W. Migula in Karlsruhe. After briefly reviewing the various preliminary methods of systematic discrimination the author has chosen the division of the *Schizomycetes* into the following five families: *Coccaceæ*, *Bacteriaceæ*, *Spirillaceæ*, *Chlamydobacteriaceæ*, *Beggiatoaceæ*. The *Schizophyta* thus far known are fully described and illustrated.

The 129 fascicles thus far published can be best obtained from the publishers, Wilhelm Engelmann, Königstr. 10, Leipzig, Germany, at a reduced subscription price. On application by postal card they furnish gratis and by mail a sample issue of 20 ppg., containing a full descriptive prospectus of the work. *Fr. H.*

Merck's 1896 Index. An encyclopedia for the physician and the pharmacist; stating the names and synonyms; source or origin; chemical nature and formulas; physical form, appearance and properties; melting and boiling points; solubilities; gravities and percentage strengths; physiological effects; therapeutic uses; modes of administration and application; regular and maximum dosage; incompatibles; antidotes; special cautions; hints on keeping and handling; methods of testing; market values, etc. of the chemicals and drugs used in medicine, in chemistry, and in the arts. Second edition. Merck & Co., New York. 1896. $3.00.

It is a rather remarkable phenomenon of the second half of this century, that whereas pharmaceutical manufactures have on the one hand materially assisted in commercalizing pharmacy, on the other hand they have ofttimes been strong supporters of the pharmaceutical sciences. The manufacture of fluid extracts, elixirs, pills and tablet triturates of almost all conceivable formulas and for almost all conceivable ailments has had a decided tendency to make a mere drug vender of the druggist. Many of these preparations, it must be admitted, have been manufactured better on a large scale than they could have been made by the average druggist, who has neither the facilities nor ofttimes the requisite knowledge and inclination to keep up the professional side of his calling.

The manufacturer was not long in learning the value of scientific aid and to-day there is hardly a large manufacturing establishment without one or more thoroughly educated chemists and with a well equipped laboratory not only for analytical work but also for research. As a result manufacturers have issued and still issue annual or semi-annual reports, some of which are of great scientific value. The impress of science was also made upon other publications. Journals were published "in the interest" of various professions, young M. D.'s were engaged to more scientifically expound the virtues of new discoveries. Even catalogues were given the stamp of scientific and historic research. There are treatises on pharmacy, which in some respects are less satisfactory than an excellent catalogue of a manufacturer of chemical and physical apparatus.

Merck's Index is in reality a descriptive catalogue of the firm Merck & Co., New York. The amount of information is so considerable that in some respects it might be termed a condensed pharmaco-medical encyclopedia. The title page gives a sufficient table of its scientific contents. A detailed criticism of the text is hardly a matter for one man. The chemistry, botany and pharmacognosy, therapeutics etc. each demand a specialist for detailed criticism that it is to be of value. It is not the writer's intention to make even a detailed criticism of all matters chemical. However, it may not be out of place to make a few remarks with regard to the chemistry of the volatile oils catalogued in the Index.

It is rather difficult to learn from the text what principle has been followed in selecting the information given. Under the titles of some volatile oils the chemical constituents are enumerated, under others not. Sometimes at least the "chief" constituent is mentioned, sometimes not; e. g. In one instance pinene is mentioned as the chief constituent, in others the same hydrocarbon evidently receives no recognition whatever. Again the chief constituent of eucalytus oil is given, viz. eucalyptol or cineol. Under cajaput oil, which contains the same substance, no mention whatever of chemical constituents is to be found.

With regard to sp. gr. the same general criticism might be made. The sp. gr. of officinal oils and of some others is given, but not of all. The sp. gr. of officinal oils can easily be found in the Pharmacopœia. If the Index is to supply such information "that *cannot be obtained* from any other book or books" it should furnish just this kind of information. If it is important to know the sp. gr. of officinal oils it cannot be unimportant to know the sp. gr. of other volatile oils catalogued in the Index.

The authors of Merck's Index do not claim perfection, but have asked for criticism in order that new editions of the work may be more and more perfected. If the book is to be used for ready reference, and for such its general makeup renders it adapted, it is highly desirable that all information should be accurate and in no way misleading. It is to be hoped, however, that Merck's Index will not entirely replace the "many volumes" from which its contents have been compiled. Books that, e. g., have the tendency to replace the Pharmacopœia do great harm. So also a single compilation of necessarily brief statements that strives to replace valuable works of reference may likewise do great harm. Chemical, pharmaceutical and other calendars contain much information convenient for ready reference, but they are not designed to replace the larger works from which their information is compiled. This is even true to a considerable extent of more encyclopædia works. A similar position should be accorded to Merck's Index and it will no doubt prove a serviceable volume.

A feature of the Index that is to be regretted is the alternation of advertisement with text. The opposition of the two does not tend to create a greater confidence in either. Certainly the authority of the text is weakened if, as it occasionally happens, it is opposed by the advertisement of preparations of questionable scientific merit. The more scientific methods are introduced into manufacture and commerce, the more will the latter prosper, but science does not benefit by commercialization.

The general make-up of the text leaves a favorable impression. The type is distinct and a sufficient variety has been employed to make ready reference easy. For a volume, which is to be replaced every year, the cloth binding is sufficiently durable. *E. K.*

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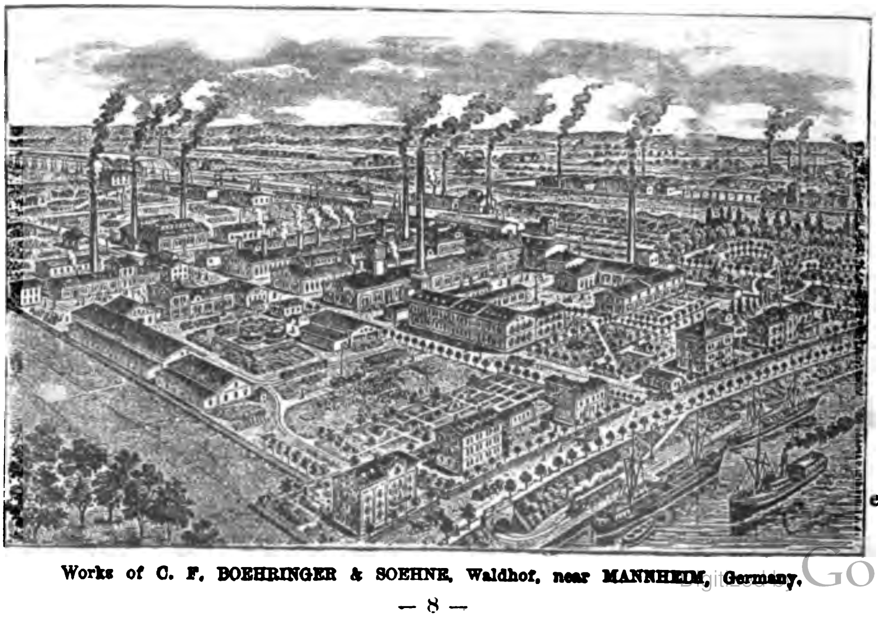

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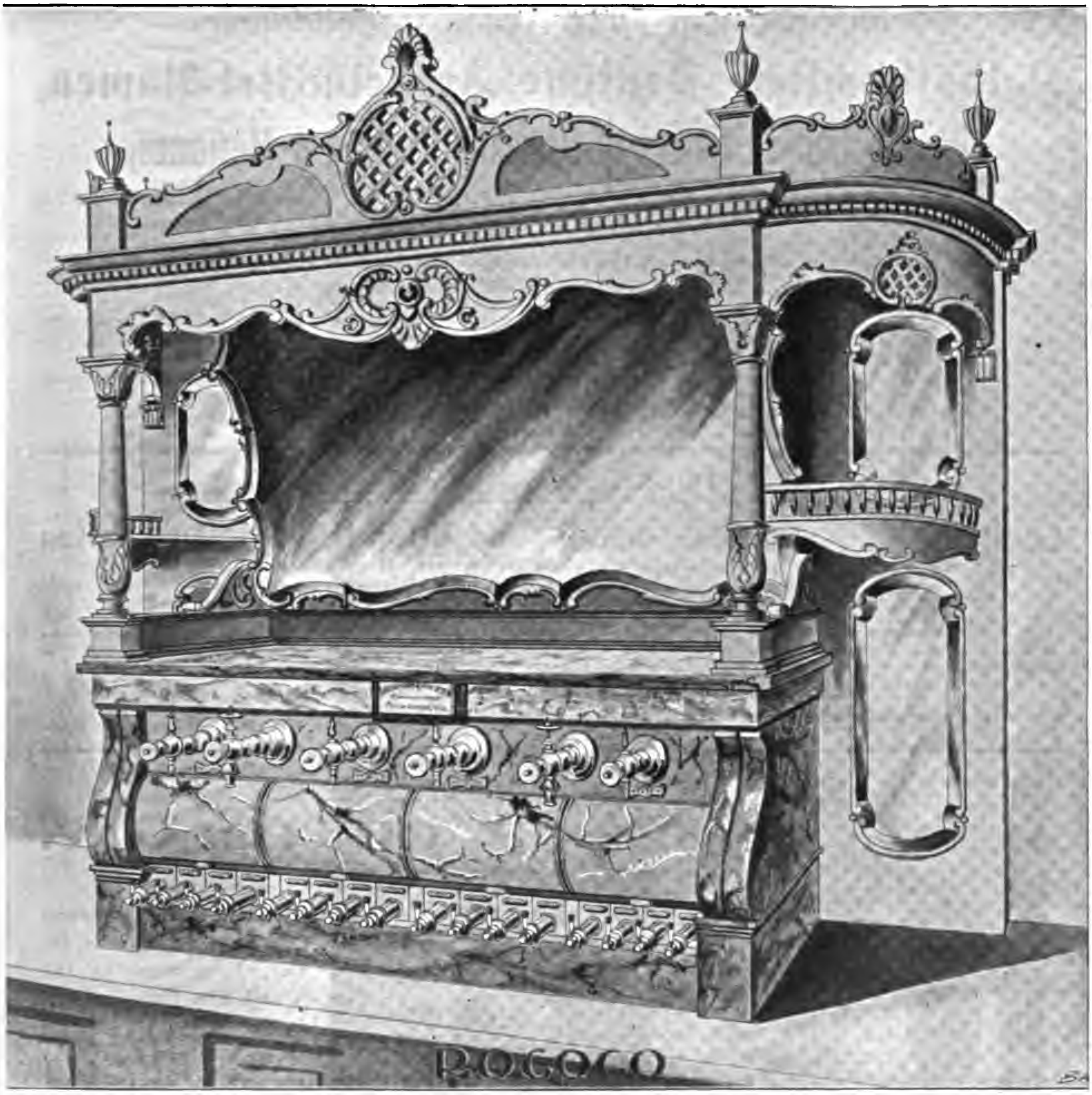

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SUPPLEMENT, APRIL 1896.

American Pharmaceutical Association.

Section on Education and Legislation.

Fourty-fourth Annual Meeting at Montreal, P. Q., Canada, August 12th to 18th, 1896.

The officers of this section solicit papers upon any subject pertaining to pharmaceutical education and legislation. As topics of interest the followihg are suggested:

1. What has been the effect of pharmacy legislation upon the practice of pharmacy in the United States?
2. What is the best form of law for regulating the labeling and sale of poisons?
3. Should a pharmacy law provide for one or for two grades of licentiates?
4. What is the best method of bringing about greater uniformity in pharmacy legislation in the different states?
5. Is the sale of intoxicating liquor in a drug store strictly for medicinal purposes a necessity, or would it be wise to prohibit the sale excepting in compounds absolutely?
6. What is the best method of conducting examinations under existing laws, and in view of the circumstances under which the boards are required to work?
7. To what extent, under existing circumstances, can the work of examining boards be made more practical?
8. To what extent should a candidate for registration in pharmacy be required to be familiar with the working formulas of official preparations?
9. To what extent should a candidate for registration in pharmacy be required to be familiar with the subjects of microscopy and volumetric analysis?
10. To what extent should the physiological properties and therapeutic action of drugs be taught as a part of a course in pharmaceutical materia medica?
11. What is the place of the "Quiz" in a course in pharmacy?

Papers upon any other topic appropriate to this section will be welcomed. Papers should be in the hands of the committee not later than June 1st, 1896.

Carl S. N. Hallberg, Chairman,
358 Dearborn St., Chicago, Ills.
Jas. H. Beal, Secretary,
Scio, Ohio.

Section on Scientific Papers.

QUERIES.

1. **Sanguinaria.** The liquid preparations slowly deposit a precipitate upon the sides of the containers. Can a menstruum be devised which will hold permanently in solution the soluble constituents?
2. **Gelatine Capsules.** What general rule should be adopted in compounding prescriptions ordering gelatin capsules? When should the ingredients be dispensed in dry powder, and when is it preferable to form them into a mass?
3. **Ichthyol.** Ichthyol is now being used internally, dissolved in water and other media. A palatable form of administration is wanted.
4. **Salol and Acetanilid** are given usually in powder form. Cannot formulas for therapeutically unobjectionable liquid preparations of the same be devised?
5. **Salicylic Acid.** It has been alleged that the synthetical salicylic acid now in the market occasionally shows the presence of salol. Is this statement correct, and if so, to what extent?
6. **Formalin.** A 40 percent solution of formaldehyde under that name is attracting much attention as an antiseptic and deodorizer. A good practical formula for its preparation by the retail pharmacists is wanted.
7. **Kamala.** It is supposed that rosin is the active constituent. Investigation recommended. Is a tincture advisable?
8. **Pyrethrum Carneum.**
   " **Roseum.**
   " **Cinerariaefolium**
   Insect Powder. Can it not be used as a medicine? On what depend their insecticide properties?
9. **Veronica Officinalis** is used largely as a house remedy for pectoral complaints and skin diseases. Is there any alkaloid or active principle in the plant to warrant such use?
10. **Viscum Album (Mistletoe)** is used by practicioners to arrest post-partum and other uterine hemorrhages. Investigation invited.
11. **Pichurim Beans.** What are they? Various descriptions of their oils are given by different investigators.
12. **Strophanthus Seeds.** A determination of the active principles in the seeds of commerce, their nature, quantity, and method of valuation.
13. **Pareira.** Pareira is a valuable diuretic and tonic drug. Buxine has been found in it, but this can hardly be the important principle. What is it?
14. **Rhus.** What is the really potent principle of the Rhus group? Is it a volatile acid as claimed by Maisch, or is it a substance resembling Cardol?
15. **Tannin.** At what season of the year should the tannin drugs be gathered? What relation does the amount of tannin present bear to that of starch? Does the tannin increase as the starch decreases? Or, is this true of some drugs but not of others?
16. **Cypripedium.** There appears to be a poisonous principle, producing effects similar to those of *Rhus Toxicodendron,* in the glandular hairs of some Cypripediums, particularly *C. Spectabile.* What is this principle?
17. **Iris.** The rhizomes of many species of Iris abound in starch, as the species that furnish the orris root of commerce, but the rhizomes of *Iris Versicolor* and of the *Iris pseudo-acorus* do not turn blue with iodine solution. What is the carbonhydrate present?
18. **Veratrum.** By what means may the rhizomes of *Veratrum Album* best be distinguished form those of *Veratrum Viride?* Some method is desirable by means of which this may be done easily and with certainty.
19. **Aconites.** The different aconites are very liable to be confounded. In the case of drugs so potent it is exceedingly important that the structure of each species liable to be gathered or sold for the officinal should be carefully described. Someone should untertake the task of the thorough investigation of the microscopical structure of all the species.

20. **Pepsin Test.** A discussion of the variable results obtained in the tests.

21. **Cotton-Seed Oil.** A review of the tests for its presence as an adulterant in other fixed oils.

22. **Cod-Liver Oil.** Are the official tests sufficient to distinguish a pure cod-liver oil? If not, what additional ones should be adopted?

23. **Methyl Acetate.** Write a paper on the possible use of methyl acetate as a solvent in pharmacy.

24. **Sodium Bisulphite.** The sodium bisulphite of commerce is rarely found more than one-fourth the strength required by the U. S. Pharmacopœia. Is the official standard too high, or does this salt rapidly deteriorate on keeping?

25. **Terpeneless Volatile Oils** are now articles of commerce. Are they liable to deteriorate on keeping? How much stronger are they than ordinary volatile oils?

26. **Lard Oil.** Lard oil appears to be grossly adulterated. Is it possible to obtain lard oil in the open market of the standard of purity of the U. S. Pharmacopœia?

27. **Guaiacol.** Commercial guaiacol varies in purity from 50 to 90 percent according to Dr. Squibb. Cannot some process be devised for its assay and purification, if necessary?

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Pharmacopoeia.—Wm. Mittelbach, Boonville; W. M. Federmann, Kansas City; Frank Garthoffner, St. Louis; J. F. Boaz, Springfield; W. A. Shelton, Marceline.

National Formulary.—Dr. H. M. Whelpley, St. Louis; Wm. Mittelbach, Boonville; Paul L. Hess, Kansas City; Prof. David Walker, Kansas City; A. H. Koch, St. Louis.

Attendance.—A. S. Forker, chairman, Kansas City; Geo. E. Hopkins, St. Louis; A. H. Coffer, Carthage; R. H. Swinney, Ashgrove; B. M. Bennett, Pierce City.

Transportation.—G. L. Parsons, Kansas City; J. F. Boaz, Springfield, Illinois; H. C. Servant, Sedalia; W. C. Johnson, St. Louis; E. Soper, St. Joseph.

Exhibits.—G. W. Clinton, chairman, Independence; C. L. Cravens, Excelsior Springs; Fred. L. Striblen, St. Joseph; J. H. Simms, Kansas City; Jas. L. Mitchell, Stockton.

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Alternates. — G. W. Clinton, Independence; A. Kansas City; S. A. Howard, Kansas City.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Oklahoma	April 7	OklahomaC'y	E. DeBarr, Norman.
Florida	May —	Jacksonville	W. M. Stewart, Palatka.
Maryland	May —	Baltimore	J. H. Hancock, Baltimore.
Massachusetts	May —		J. F. Guerin, Worcester.
Georgia	May 5	Atlanta	H. H. Arrington, Summerville.
Delaware	May 7	Dover	F. W. Fenn, Wilmington.
Alabama	May 12	Opelika	P. C. Candidus, Mobile.
California	May 12	San Francisco	D. D. Hunt, San Francisco.
Louisiana	May 12	New Orleans	J. A. Legendre, New Orleans.
Texas	May 12	Dallas	R. H. Walker, Gonzales.

Readers of the Review have inquired whether and when copies of Prof. J. U. Lloyd's Etidorhpa were to be had. The first or Author's edition of 1299 copies were subscribed for before the day of publication. The second edition of 1020 copies were sold in less than a week. The publishers, The Rob. Clarke Co., of Cincinnati have announced that a large third edition is now prepared.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Iowa		April 7	S. J. Spaulding, Des Moines.
Mississippi	Jackson	April 7	J. C. Means, Natchez.
Montana	Butte	April 7	G. W. Shoemaker, Billings.
Oklahoma	OklahomaC'y	April 7	C. P. Wickmiller, Kingfisher.
California	San Francisco	April 8	John H. Dawson, San Francisco.
Maine	Bangor	April 8	FrankP.Partridge, Augusta.
South Dakota	Huron	April 8	I. A. Keith, Lake Preston.
Dist. of Columbia	Washington	April 13	R. L. Lynch.
Nebraska	Omaha	May 13	Griff. J. Evans, Hastings.
Missouri	Kansas City	April 13	F. W. Sennewald, St. Louis.
Illinois	Chicago	April 14	Frank Fleury, Springfield.
Maryland	Baltimore	April 14	J. F. Hancock, Baltimore.
Pennsylvania	Pittsburg	April 15	C. T. George, Harrisburg.
Tennessee	Nashville	April 15	J. O. Burge, Nashville.
Wisconsin	Waupaca	April 15	E. B. Heimstreet, Janesville.
New Jersey	Trenton	April 16	A. S. Elwell, Bridgeton.
Minnesota	Madison	April 21	H. G. Webster, Minneapolis.

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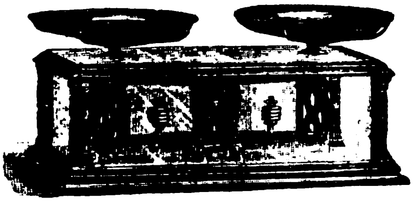

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis. as second class matter.

Vol. 14, No. 5. **MAY. 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY

DR. FREDERICK HOFFMANN AND **DR. EDWARD KREMERS.**

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 5. **MAY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

The Metric System.

The bill before Congress* with regard to the metric system of weights and measures seems to have revived the general interest taken in the adoption of a system, that, with the exception of the English-speaking people, has found almost universal application among the civilized nations of the globe. The aggregate population of the countries in which the metric system has been established by law amounts to nearly 350 millions, of those in which it has been partially introduced, to about 70 millions, and of those where its use is permissible, to 70 millions more. It has thus been adopted by much more than half of the civilized and Christian world.

The metric system has been taught in many of our public schools for some time, yet a congressman stated recently in debate that as far as he could see there was no provision made for "wet measure" and inquired "Where is your measure for whiskey?" He continued: "I venture to say that Kentucky will have something to say about the adoption of this new-fangled system. Her delegation will be solidly opposed to it." That such a joke should be greeted with laughter surprises no one. Congress has recently supported jokes of greater gravity than this one.

Such remarks, however, which are born out of sheer ignorance, may teach us a lesson. They demonstrate very forcibly how much ignorance and ill-will based on ignorance and on the lethargy to accommode oneself to something new must be overcome before we can reasonably expect to meet with ultimate success in the universal introduction of a rational system of weights and measures.

Many of the advocates of the metric system seem to expect everything from legislation. A United States senator writes that in his opinion Congress has done about all it can do and that what remains to be done is its introduction into actual practice by those who advocate it.

Whereas pharmacists have on the whole taken a progressive position with reference to the adoption of this one system in place of a confusion of old systems, writers of influential textbooks and commentaries have at times held a dual position that was positively detrimental. The effect to be derived from the adoption of the metric system of weights and measures by the U. S. Pharmacopœia was well nigh counterbalanced by the practice of those writers who placed, directly opposite the quantities of the Pharmacopœia expressed in terms of the metric system, those of older systems. Inasmuch as some of these works contain the text of the U. S. Pharmacopœia almost verbatim they have greatly hampered the progress to be reasonably expected from the introduction of the metric system of weights and measures by the Pharmacopœia. It is to be hoped that if the British Pharmacopœia makes use of this system that writers of British textbooks and commentaries will not be so ready to compromise.

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* House bill No. 7251 provides in substance as follows:

"That from and after the first day of July, eighteen hundred and ninety-eight, all the Departments of the Government of the United States, in transaction of all business requiring the use of weight and measurement, except in completing the survey of the public lands, shall employ and use only the weights and measures of the metric system.

"That from and after the first day of January, nineteen hundred and one, the metric system of weights and measures shall be the only legal system of weights and measures recognized in the United States."

We need, therefore, not blame Congress alone if the confusion of the older systems outlasts the present century. On the other hand we may hope that Congress, at present or in a near future, will do all it can to put a timely end to the present state of affairs. Inasmuch as the continuation of the old systems is based so largely on lack of information and familiarity with the new, anything that may possibly create an interest in that system which the English-speaking nations will be ultimately bound to adopt may be considered proper, particularly at this time.

It is frequently stated that the idea of taking unchangeable units from nature has been conceived in modern times and many labor under the supposition that the metric system is the universal system based on such a natural unit. As a matter of fact, however, the Chinese had such a system long before Europe was civilized, and as another matter of fact the meter, the liter, and the gram are arbitrary standards.

In 1673 Huyghens proposed the length of the second-pendulum as the unit of length, or rather one-third of the same as the *pes horarum* or time-foot (*Zeitfuss*). Huyghens supposed that the second-pendulum was equally long at all points of the globe. It, however, became known soon that the length of the second-pendulum was dependent on the latitude. Bouguer in 1749, therefore, suggested the length of the second-pendulum at the latitude of 45°; La Condamine the length of the second-pendulum at the equator as the unit of length. Neither of these propositions based on the unchangeable mass of the earth was carried.

The great variety of measures and their arbitrary and even deceitful application in taxation and commercial exchanges had given rise to numerous complaints throughout France. Among the demands of the three classes in 1789 "the abolishment of the diversity of measures" was made. On the motion of Prince Talleyrand, then Bishop of Antun, the demand received definite form in a decree of the National Assembly dated May 8th, 1790. The decree recommended the length of the pendulum beating seconds in latitude 45° as a suitable linear basis, and provided for a scientific determination of the exact lenght of this pendulum by a commission to be composed in equal numbers of members of the French Academy of Sciences and the Royal Society of London. Louis XVI, King of France, opened a correspondence on the subject with the King of Great Britain, but, owing to the temper and the public troubles of the times, this overture met with no response. Similar applications to other nations were more successful, and in subsequent proceedings, Spain, Italy, the Netherlands, Switzerland, Denmark and Sweden participated by sending delegates to an international commission. The system itself was, however, matured by the labors of a committee of the Academy of Sciences, embracing Borda, Lagrange, Laplace, Monge and Condorcet, five of the ablest mathematicians of Europe. Their report, dated Mar. 19, 1791, after considering the comparative fitness, as a standard of length, of the pendulum and of the earth itself in some one of its natural dimensions, decided in favor of the latter, and recommended as a standard unit of linear measure one-millionth of the quadrant of a terrestrial meridian. The report was communicated to the Assembly and received its sanction. Committees of the Academy were then charged with the duty of making the necessary determinations of the standard units, including those of capacity and weight as well as that of length. An arc of the meridian passing through Paris and extending from Dunkirk to Barcelona was measured trigonometrically by Delambre and Méchain, an operation of immense labor which occupied seven years; the object being to ascertain with the greatest exactness the length of the linear base called the meter. It was resolved to make the unit of volume equal to the capacity of a cubical vessel measuring one-tenth of a meter on its edges; and the standard of weight, the actual weight of distilled water which should fill such a vessel at the temperature of maximum density. The weight of a given volume of water under these conditions was made a subject of elaborate investigation by a committee of the Academy, and in conformity with the results obtained the standard unit of weight, called the *gramme*, was fixed at one-thousanth part of the standard weight above mentioned, which, being a thousand grams in weight, is called the *kilogramme*.

In order that the introduction of the new legal standards might not be postponed too long, the national assembly adopted the provisional meter on the 7th of April, 1795, finally by a decree of Dec. 10, 1799, the slightly modified *mètre vrai et définitif*.

With this legal act the signification of the meter as a so-called natural measure has become invalid, inasmuch as a correction of the same by means of later, more exact geodetic measurements is excluded.

We know now that the meter does not strictly bear the ratio to the size of the earth that was originally supposed. No stress, however, is laid on this quasi-insufficiency because other means of maintaining the standard unit have been resorted to. The theoretical side of the metric system, namely the creation of a natural measure that could be refound, rediscovered if necessary, was no success; neither did the practical side prove satisfactory. Men had hoped that so rational a system would be immediately accepted by all civilized nations, i. e. to see the meter the universal standard. The acceptance, however, of the metric system by other states proved to be the exception rather than the rule.

One benefit, however, accrued from the introduction of the metric system. England already had carefully prepared standards. Other states began to revise their standards. Scientists and technical experts in the various states were ordered to prepare accurate standards for comparison. Balances were also greatly improved during this time. One reason why the metric system did not find wider and more rapid application was the fact that France itself did not possess the power to make the older weights disappear. This was the fault of the French government, for in 1812 the old weights and measures were permitted to be used side by side with the new. It was in 1837 that a law was passed under Louis Philippe making the metric system obligatory after 1840. It is not surprising that measures doing things but half were not fit to remove old customs.

"History teaches" it is said, but people evidently do not learn. In 1868 Germany retained some of its old standards along with the new standards of the metric system and has, therefore, up to this day standards of two different systems. In no country, probably, was the confusion greater than in Germany. Each state, large or small, had its own system of weights and measures. The small dukedom of Schleswig-Holstein had no less than twenty-four different standards for land measure.

While the constitution of the United States authorizes Congress to "fix the standard of weights and measures", this power has never been definitely exercised, and but little legislation has been enacted upon this subject. Washington regarded the matter of sufficient importance to justify a special reference to it in his first annual message to Congress (January, 1790), and Jefferson, while Secretary of State, prepared a report, at the request of the House of Representatives, in which he proposed (July, 1790) "to reduce every branch to the decimal ratio already established for coins, and thus bring the calculation of the principal affairs of life within the arithmetic of every man who can multiply and divide." The consideration of the subject being again urged by Washington, a committee of Congress reported in favor of Jefferson's plan, but no legislation followed. In the meantime the executive branch of the government found it necessary to procure standards for use in the collection of revenue and other operations in which weights and measures were required and the Troughton 82-inch brass scale was obtained for the Coast and Geodetic Survey in 1814, a platinum kilogram and meter, by Gallatin, in 1821, and a troy pound from London in 1827, also by Gallatin. In 1828 the latter was, by act of Congress, made the standard mass for the Mint of the United States, and, although totally unfit for such purpose, it has since remained the standard for coinage purposes.

In 1830 the Secretary of the Treasury was directed to cause a comparison to be made of the standards of weight and measure used at the principal custom-houses, as a result of which large discrepancies were disclosed in the weights and measures in use. The Treasury department, being obliged to execute the constitutional provision that all duties, imports, and excises shall be uniform throughout the United States, adopted the Troughton scale as the standard of length; the avoirdupois pound, to be derived from the troy pound of the mint, as the unit of mass. At the same time the department adopted the wine gallon of 231 cubic inches for liquid measure and the Winchester bushel of 2150.42 cubic inches for dry measure. In 1836 the Secretary of the Treasury was authorized to cause a complete set of all weights and measures adopted as standards by the department for the use of custom-houses and other purposes to be delivered to the governor of each state of the Union, for the use of the states, respectively, the object being to encourage uniformity of weights and measures throughout the Union. At this time several states had adopted standards differing from those used in the Treasury department, but after a time these were rejected, and finally nearly all the states formally adopted, by act of legislature, the standards which had been put in their hands by the national government. Thus a good degree of uniformity was secured, although Congress had not adopted a standard of mass or of length, other than for coinage purposes, as already described.

The next and in many respects the most important legislation upon the subject was the act of July, 28, 1866, making the use of the metric system lawful throughout the United States and defining the weights and measures in common use in terms of the units of this system. This was the first general legislation upon the subject, and the metric system was thus the first, and thus far the only, system made generally legal throughout the country. By not doing more Congress has thereby added to our already confusing systems, rather than to remove all confusion by one bold stroke.

While the cause of the metric system was thus advanced on the one hand and checked on the other, the importance of a universal standard became more and more evident with each decade. The universality of science, the constant growth of the industries and the increasing interchange of natural products and manufactured articles demonstrated the necessity of uniform standards.

At the time of the first world's fair in London in 1851, manifold products from all the world over were brought to this city. He who desired to learn about their economic value encountered the problem of deciphering hundreds of different specifications of weights and measures. The same problems presented themselves in a still greater degree in 1855 in Paris, 1862 in London, and 1867 in Paris.

At the time of the Paris exposition in 1867, a committee representing 21 states came together and a resolution formulated by Jacobi of Petersburg was adopted stating the following conclusion: "The metric system is qualified throughout to be adopted generally on account of its scientific foundation, on account of the uniform construction of all its parts and on account of the simplicity and easiness of its application in the sciences, arts, industries and in commerce."

Soon after the exposition of 1867 the metric system was adopted by Germany and Austria, a few years later by Switzerland and the Scandinavian countries.

How intercourse has been simplified in each country and particularly between different countries since a number of states employ the same standards, how much time, labor, vexation and money has been saved, but very few people comprehend.

With the adoption of the metric system by other states, a new demand was created which resulted in the equipment of an international institute, the labors of which came to a conclusion in 1889.

As long as each state has its own system of weights and measures, it is its duty to protect the normal standards against changes and to give every person who is need of the same an opportunity to obtain weights and measures that accord with the normal standards.

No state, that has desired a good condition of its system of weights and measures has delayed to compare carefully its standards with the standards of other countries. But for the correctness of the yard England alone was responsible, for that of the meter France, for that of the Rhenish foot Prussia, etc.

Time and conditions had changed. It is true the French system had been adopted, but could France be granted the guardianship over the unchangeability of weights and measures for other states, and could France be made sole agent for accredited copies of standards?

Such a privilege was all the more unwarranted since the general faith in the correctness of the French standards issued in the past decades had become shaken through carelessness of French officials.

As a result of the conference of 1874 in which Austria-Hungary, Belgium, Brazil, Denmark, France, Germany, Great Britain, Greece, Italy, the Netherlands, Peru, Portugal, Russia, Spain, Sweden and Norway, Switzerland, Turkey, the United States of North America and Venezuela were represented, the French government invited these states to create an international bureau for measures and weights. This conference met in March and April 1875, and there was created the *Convention du mètre, signée le 20. Mai 1875.*

At the expense of the interested states, a building was purchased for 400,000 francs, in which there was established an international bureau of weights and measures, which undertook to prepare and compare the fundamental standards. This bureau worked under the directions of and was controlled by the international committee. This committee again was placed under the authority of a *conférence génerale de poids et mesures*, the members of which were appointed for each general conference by the governments interested in the work.

For the international bureau a number of distinguished scientists were secured with the excellent Dr. Ole Broch at their head, who unfortunately died shortly before the last general conference. For the home of the international bureau the French government purchased the *pavillon de Breteuil* near Sèveres directly adjoining the park of St. Cloud.

The mere fact that most civilized nations deemed it necessary to send delegates to an international conference of weights and measures in itself indicates the importance of an international adjustment of weights and measures. It is true that the most costly fabrics are not measured by the millimeter and that gold and silver are not weighed by the milligram. However, in scientific measurements and in the manufacture of exact instruments a difference of 1/10 mm. i. e. the 1/10,000 part of the meter cannot be overlooked. Besides, such measurements cannot be carried out with the original standards but with copies from copies of these standards. It is therefore apparent that the prototypes from which the copies, to be used in the sciences, the arts, and in commerce, are taken must be very exact. In order to achieve this the following rules were laid down by the international committee as a guide for the bureau:

1.) The old standards of the metric system, the *mètre* and the *kilogramme des archives*, are taken as the basis for the new international prototypes.

2.) For this purpose several copies are prepared which agree as nearly as possible with the old standards.

3.) From these copies that meter measure and that kilogram weight are selected which agree best with the old standard. These two are to be regarded thereafter as the international prototypes. The old standards henceforth have but an historic interest.

4.) The international prototypes as well as the copies to be prepared for the interested states are to be made from platinum-iridium (9—1) and are to be of the same prescribed form.

5.) For all prototypes the expansion by heat is to be determined with great exactness.

In 1889 the bureau at Breteuil, supported by various members of the committee, had succeeded so far in its task that 30 meter measures and 40 kilogram weights could be distributed as national prototypes. The money value of the metal alone is represented by 4 million francs. None of the meter measures 1—30 differ from the international prototype by 1/100 mm. The differences have been estimated up to 1/5000 mm. Of the kilogram weights not one of the national prototypes 1—40 differs from the international prototype by 1 mgr. The real difference is determined down to 1/200 mgr.

A degeneration of measures has therefore become almost impossible, since this would mean the destruction of all of the new prototypes.

The object of the last general conference was to examine and compare the national prototypes with the international prototypes and distribute the former. The national prototypes were distributed Sept. 26, 1889, by allotment. The international prototypes together with documents etc. were placed in the deepest cellar in Breteuil under threefold lock Sept. 28.

The United States received meters Nos. 21 and 27 and kilograms Nos. 4 and 20. The seals from meter No. 27 and kilogram No. 20 were broken Jan. 2, 1890 in the Cabinet room of the Executive Mansion by the President of the United States in the presence of the Secretary of State and the Secretary of the Treasury, together with a number of invited guests. They were thus adopted as the national prototype meter and kilogram.

The Troughton scale, which in the early part of the century had been tentatively adopted as a standard of length, has long been recognized as quite unsuitable for such use, owing to its faulty construction and the inferiority of its graduation. For many years, in standardizing length measures, recourse to copies of the imperial yard of Great Britain had been necessary, and to copies of the meter of the archives in the office of weights and measures. The standard of mass originally selected was likewise unfit for use for similar reasons, and had been practically ignored.

The national prototypes adopted in 1890 now serve as fundamental standards. It was doubtless the intention of Congress that they should thus be used when the international metric convention was entered into in 1875. The practical effect upon our customary weights and measures is, of course, nothing. The Office of Weights and Measures, with the approval of the Secretary of the Treasury, has adopted the national prototypes, the exact relation of which to the international prototypes is accurately known, as the fundamental standards, and the customary units—the yard and the pound—are derived therefrom in accordance with the act of July 28, 1866. *E. K.*

ORIGINAL CONTRIBUTIONS.

On the Chemical Composition of the Oil of Sassafras Bark and Oil of Sassafras Leaves.

By Dr. *Fred. B. Power* and Dr. *Clemens Kleber.*

I. Oil of Sassafras Bark.

This oil has long been recognized by the United States Pharmacopœia, and is very largely used in the United States, chiefly for flavoring purposes or for perfuming ordinary soaps. It is obtained, as is well known, by the distillation of the roots, with adhering bark, of the sassafras tree[1], which is known botanically as *Sassafras officinale* Nees, or *Laurus Sassafras* Linné, or *Sassafras variifolium* (Salisbury) O. Kuntze (Nat. Ord. *Laurineæ*).

The first chemical examination of this oil appears to have been made by Grimaux and Ruotte[2], who stated it to consist of about 90 percent of safrol and 10 percent of hydrocarbon, $C_{10}H_{16}$, which was termed safrene. They also observed the presence of an extremely small amount of phenol, which was much more recently recognized by Pomeranz[3] as eugenol, and estimated by him to be contained to the extent of 0.23 percent in the oil. Other investigations which have hitherto been made of this oil, such, for instance, as those of Saint Evre[4], Faltin[5], and Flückiger[6], relate chiefly to the action of chemical agents upon the oil or to the characters of the safrol contained therein, but without affording any further knowledge of its constituents.

As we had an opportunity some time ago of distilling a considerable amount of this oil directly from the bark[7], it seemed to us of interest to subject it to a more complete chemical study, the results of which are here presented. The yield of oil from the air-dry bark was 7.4 percent. The oil has a yellowish or reddish-yellow color, a specific gravity of 1.075 at 15° C., and an optical rotation of + 3° 16′ in a tube of 100 mm. The wood of sassafras roots, deprived of the bark, yields a comparatively small amount of oil, only 0.9 percent, but this has the same specific gravity and the same properties as the oil distilled from the root bark.

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[1] An interesting Essay on Sassafras, by the late William Procter, Jr., is contained in the Proc. Amer. Pharm. Assoc., 1866, p. 211. This relates chiefly to the history and distribution of the sassafras tree, the distillation of the oil, etc.

[2] Comptes rendus, 68 (1869), p. 928.

[3] Chemiker Zeitung, 14 (1890), Rep. p. 232.

[4] Ann. Chim. Phys., [3] 12, 107, and Liebig's Annalen, 52, p. 396.

[5] Liebig's Annalen, 87 (1853), p. 376.

[6] London Pharm. Journ., 17 (1887), p. 989, and Jahresb. d. Chemie, 1876, p. 910; 1887, p. 94.

[7] Schimmel & Co's Semi-Annual Report, October, 1893, p. 39.

In this investigation only the oil distilled by ourselves was employed. Three thousand grammes of the oil were first placed in a freezing mixture of ice and salt, in order to separate the safrol contained therein. Under these conditions, and even after rubbing the sides of the vessel with a sharp-edged glass rod, no separation of crystals took place after several hours. It was this behavior of the oil which led Grimaux and Ruotte (loc. cit.) to consider safrol as an uncrystallizable body. The crystallization of the safrol takes place, however, immediately as soon as a trace of solid safrol, which has been otherwise obtained, is brought in contact with the oil. The crystalline mass was then allowed to drain well, and, in order to separate any enclosed liquid, it was repeatedly melted, crystallized, and drained. By the subsequent fractionation of the remaining liquid portion of the oil, that fraction which was collected at 230° C. was likewise subjected to the treatment above described, and we thus obtained a total of 2340 gm. safrol, or 78 percent. With consideration of the small amount of safrol which undoubtedly still remained dissolved in the oil, the total amount of safrol in the oil may be regarded as about 80 percent. The oil, deprived as completely as possible of safrol by exposure to cold, was then shaken with a 2 percent solution of sodium hydrate until nothing more was taken up by the latter, the alkaline solution freed from any suspended drops of oil by shaking it with ether, then acidulated, and again extracted with ether. By the careful evaporation of the latter, 15 gm., or 0.5 percent, of a yellowish oil was obtained, the odor of which indicated it to consist of eugenol, and, as previously stated, this had already been recognized as a constituent of sassafras oil. For the more exact identification of this body, it was converted into the benzoate, according to the method of Schotten-Baumann, and was found to yield very readily a body which crystallized from alcohol in handsome, compact prisms, having a melting point of 69° C., and thus, as was expected, consisted of pure eugenol benzoate.

The oil freed from eugenol was subjected to repeated distillation, when about one-half of it passed over between 155° and 175° C., and of this the greater portion distilled between 155° and 160° C. From the latter a nitrosochloride was readily obtained, and from this in turn the benzylnitrolamine of pinene, melting at 123° C. The small fraction distilling between 160° and 175° C. contained an abundance of phellandrene, which was identified by the formation of its nitrite. A small portion distilling between 170° and 175° C. was especially tested for the possible presence of cineol and dipentene, for these two bodies are known to be constituents of camphor oil[8], and, as our subsequent summary of the constituents of sassafras oil will show, the latter closely resembles camphor oil in its qualitative composition. The tests for these bodies were, however, attended with negative results, for by leading gaseous hydrobromic acid into the well-cooled solution of the respective fraction in petroleum ether no crystalline compound was formed, nor could a solid bromide be obtained. The body to which the name of safrene has been given by earlier investigators, and to which we have already referred, thus appears to consist simply of a mixture of a large amount of pinene with some phellandrene.

The portion of the oil which distilled at first between 175° and 200° C. became resolved by further fractionation into bodies of lower and higher boiling points. At a temperature above 200° C. an abundance of crystals separated in the tube of the condenser, and the distillate itself formed a thick mass on cooling. When deprived of liquid by means of a filter pump, an abundant amount of white crystals was obtained, which, from their appearance and odor, were recognized as camphor. Their alcoholic solution was strongly dextro-rotary, they could readily be sublimed, and afforded with hydroxylamine a handsomely crystallizable oxime, having a melting point of 115° C. This body was therefore positively identified as dextro-rotary camphor, a constituent of the oil which has been overlooked by previous investigators.

The portion of oil which distilled between 200° and 260° C. could be separated almost completely by fractionation and crystallization into camphor and safrol. From the thick, resinous residue which remained at a temperature above 260° C. we obtained subsequently a small fraction distilling between 260° and 270° C. In this the presence of cadinene was presumed, as it gave in glacial acetic acid solution with a trace of sulphuric acid the violet coloration which is characteristic for this sesquiterpene. It was therefore diluted with ether, and saturated with gaseous hydrochloric acid, when, as is usual in the presence of cadinene, a deep violet coloration ensued, but on evaporation no solid hydrochloride was obtained. It is possible that this negative result was due to the presence of impurities, as on account of the very small amount of this fraction its thorough purification was impossible, and the presence of this sesquiterpene must therefore be left in doubt.

In order, finally, to determine the amount of camphor present in the oil, it was converted, by reduction, into borneol, and the latter then estimated in the form of its acetic ester. For this purpose 20 gm. of the oil were dissolved in absolute alcohol, and 5 gm. of metallic sodium gradually brought into the liquid at the boiling temperature. After the complete solution of the sodium a considerable amount of water was added, and the separated oil was boiled for an hour with acetic anhydride and a little anhydrous sodium acetate. The resulting liquid was then washed with water, and subsequently with a solution of sodium carbonate until perfectly neutralized, then dried by means of calcium chloride and filtered. On saponification with an alcoholic normal solution of sodium hydrate, 7.4 cc. of the latter were required for the saponification of 17.55 gm. of the acetylized oil, which would correspond to 6.8 percent of camphor in the original oil.

From the results of this investigation the constituents of the oil of sassafras bark, and the relative proportions in which they are contained therein, may be summarized as follows:

Safrol	$C_{10}H_{10}O_2$,	about	80.0%
Pinene	$C_{10}H_{16}$	“	10.0%
Phellandrene	$C_{10}H_{16}$		
Camphor, dextrogyrate	$C_{10}H_{16}O$,		6.8%
Eugenol	$C_{10}H_{12}O_2$,		0.5%
A high boiling portion, consisting of:			
Cadinene, $C_{15}H_{24}$ (?), and residue		about	3.0%
			100.3

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[8] Schimmel & Co's Bericht, April, 1889, p. 9.

In this summary the marked similarity in the qualitative composition of sassafras oil and camphor oil is apparent, the latter containing in addition small amounts of cinol and dipentene. This similarity in the composition of the two oils is, however, not surprising, in view of the fact that the sassafras and camphor trees belong to the same plant family, and in the classification of Linné were included in the same genus.

II. Oil of Sassafras Leaves.

It is quite well known, and has already been recorded by the late Professor Flückiger[9], that the leaves of the sassafras tree, when crushed, develop a finely aromatic odor, not at all reminding one of safrol. It was, indeed, chiefly upon the instigation of Professor Flückiger, during a visit to the laboratories of Messrs. Fritzsche Brothers, at Garfield, N. J., in the summer of 1894, that we were led to undertake the distillation and examination of this oil. The material for this purpose was collected in the immediate neighborhood of the factory at Garfield, and a preliminary notice of the oil was given in the Semi-Annual Report, October, 1894, p. 71, of Messrs. Schimmel & Co. As there stated, the yield of the oil is exceedingly small, amounting to but 0.028 percent of the weight of the fresh leaves, of which we distilled over 8000 pounds.

As we are not aware that this fragrant oil has ever been obtained heretofore, or at least in an amount sufficient for its chemical examination, it has been to us a subject of special interest.

The oil possesses a light yellow color and an exceedingly agreeable, somewhat lemon-like odor. Its specific gravity is 0.872 at 15° C., and its optical rotation + 6° 25′ in a tube of 100 mm.

On shaking the oil with a solution of sodium bisulphite a considerable amount of a solid compound separated out, which, however, on gently heating, showed an inclination to liquefy. This behavior indicated the presence of citral. To confirm this the bisulphite compound was pressed, washed with ether, and decomposed, when an oil was obtained having an intense lemon-like odor, and this, when treated with pyroracemic acid and β-naphtylamine, readily yielded the citryl-β-naphtocinchoninic acid, melting at 196° C. The lemon-yellow laminæ of this compound, when observed under the microscope, showed characteristic forms.

The oil deprived of this aldehyde, and washed with a solution of sodium carbonate, could not be completely distilled without decomposition, either under ordinary pressure or in a vacuum. A constant elimination of water took place, the distillate had an acid reaction, and the more volatile portion of the distillate contained a considerable amount of dipentene, which was identified by means of its tetrabromide. This behavior pointed to the presence of a readily decomposable ester. The oil was therefore saponified with an alcoholic solution of potassium hydrate, and the product distilled with steam. There remained a considerable amount of a thick residue, which, on cooling, solidified to a butter-like mass. It dissolved in a warm mixture of alcohol and ether, and, on cooling, again solidified to a magma of thin laminæ. These were again re-crystallized several times from a mixture of ether and alcohol, and finally showed a melting point of 58° C. The entire appearance of this body, as also its resistance toward the ordinary reagents, even warm sulphuric and nitric acids, left no doubt as to its identity as a paraffin. It could naturally not be determined whether it represents a single substance, for it is well known that it is hardly possible to purify or separate the paraffins completely by simple re-crystallization. The mother-liquor from the paraffin contained, furthermore, a considerable amount of a thick, oily body, which only distilled at a very high temperature, with accompanying decomposition, and which apparently consisted of polymerized and resinified products of terpenes.

From the aqueous, alkaline solution which remained after the distillation with steam the acids were liberated by means of dilute sulphuric acid and distilled by steam. Some oily drops were obtained in the distillate, which, judging from their odor, as also that of their ethyl ester, consisted of iso-valerianic acid. The remaining distillate, after being neutralized and concentrated, was fractionally precipitated by silver nitrate. After separating the first precipitate, there was thus obtained the silver salt of acetic acid.

0.2387 gm. of the silver salt afforded 0.1532 gm. of silver, corresponding to 64.2 percent.

Silver acetate contains 64.7 percent of silver.

The saponified oil which had been distilled by steam, as previously described, was subjected to fractional distillation under a pressure of about 25 mm. It was thus resolved into essentially three fractions, having the boiling points respectively of 60 to 80°, 100 to 120°, and 135 to 140° C. In the first fraction both pinene and a considerable amount of phellandrene could easily be detected by means of their respective benzylnitrolamine and nitrite compounds. Furthermore, the odor and taste of this fraction also indicated the presence of the aliphatic terpene, myrcene (with three double bonds), which had previously been isolated by us from bay oil[10]. Unfortunately, no reactions are as yet known for the certain identification of this body, although its presence in this oil is made very probable for the following reasons:

1. By the slow distillation of this terpene fraction under ordinary pressure only a portion passed over below 200° C., the remainder forming a thick oil which only distilled at a temperature above 300° C., with partial decomposition.

2. When gently heated for half an hour with glacial acetic acid and a trace of 50 percent sulphuric acid, the fraction acquired the unmistakable odor of linaloyl acetate, a behavior which is characteristic for myrcene.

3. Two fractions which were collected in the neighborhood of 70° C., under a pressure of 25 mm. possessed the following physical constants:

Fraction I. Spec. grav. at 18.5° 0.8429, $[\alpha]_D=$ 1.4734, M_D[11] 45.29; fraction II. spec. grav. 0.8395, $[\alpha]_D$, 1.4760, M_D 45.69. The specific gravity is thus lower than that of any of the known terpenes, and that of myrcene we have previously found to be 0.8006 at 15° C. On the other hand, the molecular refraction is higher than may be calculated for even a terpene with two double bonds ($M_D=45.24$), although the presence in this case of pinene, which only contains one double bond, must naturally diminish the refraction.

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[9] Pharmakognosie des Pflanzenreiches, 3d edit., p. 452.

[10] Pharm. Rundschau, March, 1895.

[11] Calculated according to the n^2 formula.

The fraction 100 to 120° C. distilled, for the most part, under ordinary pressure at about 200° C. By its odor, as also that of its acetic ester, it was unmistakably recognizable as linalool. Furthermore, by gentle oxidation with a chromic acid mixture we readily succeeded in converting it into citral, which in turn was further identified by its conversion into the characteristic citryl-β-naphto-cinchoninic acid.

The third fraction (135 to 140° C.) distilled under ordinary pressure at 230° C., and its odor indicated it to consist of geraniol. We succeeded also in obtaining therefrom, after prolonged treatment with anhydrous calcium chloride, the compound which is characteristic of this alcohol.

For the quantitative estimation of the linalool and geraniol, which are evidently contained in the oil both in the form of the acetic ester and in the free state, the following experiments were conducted: 19.19 gm. of the oil required for saponification 2 to 3 cc. of alcoholic normal solution of sodium hydrate, which would correspond to 2.4 percent of linaloÿl- and geranylacetates. On the other hand, after boiling the oil for one hour with an equal volume of acetic anhydride and a little anhydrous sodium acetate, 14.36 gm. of the acetylized oil required for saponification 10.7 cc. of normal alkali, corresponding to 12.1 percent of the alcohols linalool and geraniol, $C_{10}H_{18}O$. It should, however, be noted in this connection that the actual percentage is probably considerably higher, for it has been shown by investigations conducted in the laboratories of Messrs. Schimmel & Co., Leipzig (see Bericht, April, 1893, p. 36), that the acetylization of linalool is not by any means quantitatively effected.

The small residue which remained above 140° C., under a pressure of 25 mm., afforded the color reaction of cadinene, but, as in the case of the oil from sassafras bark, a solid hydrochloride could not be obtained therefrom.

The oil of sassafras leaves, therefore, contains the following bodies:

Pinene	$C_{10}H_{16}$
Myrcene (?)	$C_{10}H_{16}$
Phellandrene	$C_{10}H_{16}$
Linalool	$C_{10}H_{18}O$
Geraniol	$C_{10}H_{18}O$
The Acetic and Valerianic Esters of these alcohols,	$C_{10}H_{17}—C_2H_3O_2$ and $C_{10}H_{17}—C_5H_9O_2$
Cadinene (?)	$C_{15}H_{24}$
A paraffin	$C^nH^{2n}+^2$

In the two oils here described we have a striking and interesting sample of the fact, which has repeatedly been observed in other instances, that different parts of the same plant may produce essential oils which are fundamentally different in their chemical composition.

Laboratory of Fritzsche Bros., Garfield, N. J.

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The Pasteurization of Milk.

By Dr. *H. L. Russell.*

The present agitation concerning the purity of food products is a question of paramount and ever-increasing interest. Although its influence is being felt in all of the industries concerned with the preparation of food stuffs yet in no one line is it more intense than in the dairy business.

Much attention is being paid to the different forms of adulteration and sophistication of foods, but there is another phase of the question, the importance of which has often been overlooked, and that is, the contamination of milk, especially by bacteria, harmful or innocuous, that gain access to the same from the time it is drawn from the cow until it is consumed.

In some respects the importance of this is far greater than in the case where the butter fat is abstracted by skimming, or water is added to the milk, for the addition or withdrawal of these elements does not render the milk especially harmful, while the presence of many kinds of bacteria changes the chemical nature of the milk, often greatly impairing its nutritive value. In one case the customer is cheated by his failure to receive that which he supposes he has bought; in the other he may be drugged with the by-products that ofttimes possess violent toxic properties. Milk is so admirably adapted to the development of bacterial life that unless special precautions are taken, it invariably becomes highly contaminated with these living organisms that work over its material, multiplying incessantly and forming by-products of their growth that develop the different fermentations that are to be noted in this fluid.

The actual number of bacteria found in milk varies greatly from time to time, but the entrance of a few will in a short time suffice to produce the most profound changes possible. The early presence of bacteria in milk is almost invariably associated with dirt and filth, more especially in the milking and immediate handling of milk subsequent thereto. If carelessness prevails at this time the milk is filled with numerous organisms that are derived from the dust of the barn, filth, animal excreta, and numerous other sources.

Ordinarily we think of sewage as a substance incomparably rich in bacterial life, but much of the milk that is consumed by us on our tables actually contains a larger number of living germs than are to be found in sewage. The kind of bacteria present in each, is, of course, somewhat different, but even in milk there are almost invariably found micro-organisms derived from the intestinal tract of animals that do not differ in any material way from the same kind of germs that inhabit the human digestive tract.

We may roughly classify the bacterial life in milk, for our present purpose, into three groups. First,—The normal milk bacteria that are concerned in the usual fermentative processes (souring, etc.) and which are not in any special degree harmful. Second,—Bacteria that are not disease-producing themselves but which are able to form by-products of a harmful nature when ingested by the susceptible individual. Undoubtedly many of the infantile diseases like dysentery and summer complaint are produced by this class of germs. Third,—Bacteria capable of producing disease, that may be derived either from the animal herself, as in tuberculosis, or which may obtain an entrance into the milk after it is milked and there find favorable conditions for growth, as in typhoid fever and diphtheria.

The elimination or keeping out of all kinds of bacteria will unquestionably have a very beneficial effect, as not only the normal and abnormal fermentative processes will be stopped, thus improving the keeping quality of the milk, but the hygienic value of the material will be much greater when this freedom from harmful germs is established.

To accomplish this desirable result, two methods have been suggested, the first of which is to exclude, as far as possible, the entrance of bacteria into the milk. By using the greatest care in securing the milk and the subsequent handling of the same, its bacterial content is greatly reduced. This improves its keeping quality very materially, and the great care taken in its handling will lessen the danger from disease germs that are derived from extraneous sources. To determine its freedom from tuberculosis, herds are tested with tuberculin, and the milk of all animals reacting to this test is excluded from the general supply; milk secured under such careful conditions is a perfectly natural product and is practically in the same condition as it was in the udder of the animal. The difficulties, however, in obtaining such a product are very great and it requires much care and watchfulness that necessarily involves considerable expense. Milk so handled is often called "certified milk" and where it has been introduced it has given much satisfaction. When handled in this way, it is, at least theoretically, the most perfect product that can be secured, but the practical difficulties are such that other methods involving less expense are greatly desired.

The attempt has been made to secure the same result in another way, that is, by the destruction of the contained bacteria, in whole or in part, by means of agents that do not injure the nutritive value of the milk. For this purpose heat has been most extensively used. It is applied in two ways,—

1. Sterilization, where the milk is heated to a temperature at or near the boiling point for a considerable length of time. By this method all of the bacterial life in the milk is affected more or less, the micro-organisms in the vegetative condition being entirely destroyed and the more resistent spores killed or weakened to such an extent that their power of development is much diminished. Milk so treated has its physical and chemical characteristics altered somewhat, there being a pronounced cooked taste which is objectionable to some. This method, as a rule, involves the use of superheated steam so that the apparatus designed for the purpose must be strong and well made, and therefore too expensive for use except on a large commercial scale.

A modification of this method, applicable in a small way, is the sterilizing of milk in ordinary streaming steam. In this instance, the milk is merely subjected to the temperature of boiling water, therefore, the disinfecting action of the steam is not nearly so great as it is where this agent is subjected to pressure. As an illustration of a simple arrangement that is applicable for this purpose the Arnold sterilizer, a cut of which is shown in figure 1, may be mentioned.

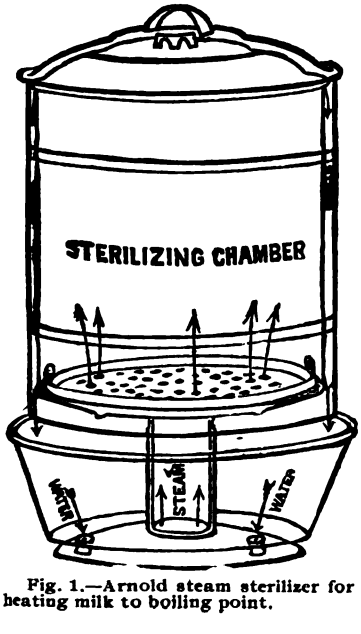

Fig. 1.—Arnold steam sterilizer for heating milk to boiling point.

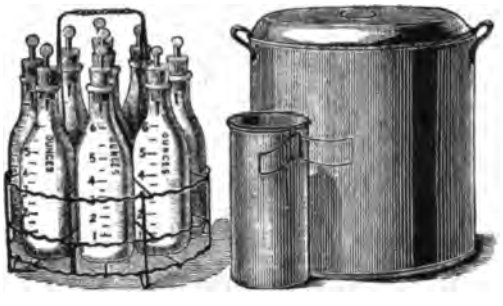

Fig. 2.—W., T. & Co. No. 1 Sterilizer. Shows a device where the bottles are graduated and closed with perforated rubber stoppers. The glass plug can be withdrawn so as to allow the expelled gases to pass off.

2. Pasteurization, so named in honor of Pasteur, who applied the principle to the heating of wines to prevent after-fermentations, consists in the application of a much lower degree of heat for a shorter time. The high temperature is maintained long enough to destroy the developing bacteria, but no attempt is made to kill the spore-bearing forms that are always able to withstand a much severer treatment.

The conditions, as to temperature and time, under which the vegetating bacteria are destroyed by heat vary with different kinds of germs. As a rule, exposure to a temperature of 130—135 degrees F. for ten minutes is usually fatal, but some bacteria, notably the tubercle bacillus, are able to withstand a higher temperature. Inasmuch, as the danger from this particular species is greater than from any other disease form, the minimum limit selected is the maintainance of a sufficient heat for a sufficient time to destroy this organism.

The highest available temperature should be below that at which the milk acquires a permanently cooked taste. This gives some latitude in heating as the milk may then be treated for thirty or forty minutes at 148 to 150 degrees, or by increasing the temperature, the same effect may be produced at 160 degrees for ten or fifteen minutes. In our experience, a medium standard has been taken, 155 degrees for fifteen or twenty minutes. Mistakes in quick and accurate thermometer readings, or in the accuracy of instruments are liable to occur and if a medium standard is selected danger from overheating is less.

While the heating process is essential in destroying the vegetating bacteria, it is quite as necessary that the product should be immediately cooled and thoroughly chilled, so as to prevent the germination and growth of the spores that are not destroyed by the heat. The temperature at which the milk is stored after pasteurization largely determines the keeping quality of the product; the lower the temperature the slower the development of the contained bacteria and the less rapid the subsequent changes in the milk. If the milk has been properly handled and stored in an ordinary refrigerator, it will usually keep sweet from three to six days; in many instances, we have had samples treated in the ordinary way that remained sweet from two to three weeks.

The relation of the temperature changes that take place during the pasteurizing and cooling of the milk to the growth of bacteria can best be illustrated in the following figure.

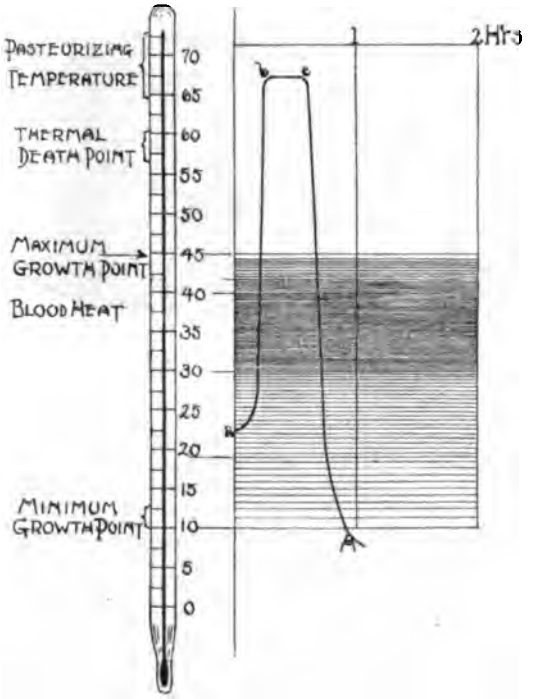

Fig. 3.—Diagram showing temperature changes in milk subjected to the pasteurizing process and the relation of the same to the growth of bacteria.

Bacterial development occurs between 10—43° C.; the most rapid growth being designated by deeper horizontal shading. The black line aA indicates the temperature changes in pasteurizing; a to b the heating process, b to c the maintainance of a proper temperature and c to A the cooling. The necessity of rapid cooling of the milk to a temperature below the germination point is apparent.

The principle of pasteurization can be applied to the preparation of milk in small quantities for family use, or in specially designed apparatus to be used on a large commercial scale. A contrivance suitable for the first purpose is shown in fig. 4. In its construction nothing is needed that will not be found in any well ordered kitchen, except a thermometer.*

The capacity of these family pasteurizers is, however, necessarily limited, and to prepare the product on a commercial scale especially designed apparatus is recommended. Many different devices for this purpose have been suggested but the great majority of them have been constructed from a falsely economical standpoint, which is the treatment of the largest possible amount of milk in the shortest possible time, without any special reference to whether all of the milk has been sufficiently heated for the proper time to destroy not only the organisms of fermentation but any possible disease germs that might be present.

It is not our purpose to enter into a discussion of the different devices that have been constructed for this purpose. The fundamental principles involved in the best machines may be briefly included in the following generalizations:—

1. The apparatus should be constructed so that all of the milk can be heated for a definite length of time at a definite temperature.
2. All parts of apparatus should be easily accessible so that they may be thoroughly cleaned and sterilized.
3. The apparatus should be as simple as possible in construction, economical in use, and the milk should be protected during the pasteurizing process and subsequently from reinfection.

The salient advantages that commend pasteurized products to the consumer are two-fold.

1. Enhanced keeping quality: In city trade the daily milk supply must be brought from the country districts, often from long distances, so that a number of hours elapse before the milk is placed in the hands of the consumer. During transportation it must be handled a number of times, and only at considerable expense can it be kept below a temperature at which bacterial growth takes place. The inevitable result of these conditions is that the "life" of the milk in the hands of the consumer is very short so that considerable loss is occasioned by the souring of the same. The souring changes are due to the decomposition of the milk sugar under the influence of the lactic-acid-producing bacteria. These organisms, as a rule, do not form spores so they succumb readily to the action of heat. On this account pasteurized milk has the very evident advantage that it keeps enough better than raw milk to justify its use.

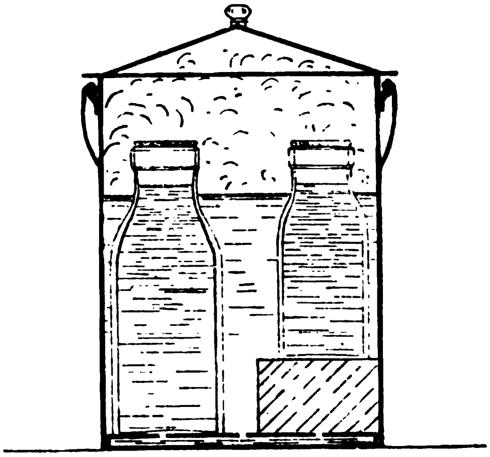

Fig. 4.—A simple arrangement for pasteurizing milk for family use. A covered tin pail will serve as a receptacle for bottles and water. A shallow bench on which to set the bottles to keep them from "bumping" may be made from a tin plate punched full of holes. An inverted bowl or block will serve to equalize level of milk in different sized bottles where such are used. Cover is removed when temperature of water is taken. Bottles may be closed with a clean pulp cap or clean cotton batting.

2. Freedom from noxious bacteria: While the economic advantage of pasteurized milk appeals to the consumer, the hygienic and sanitary importance of the same outweighs all other considerations. In its preparation, it is heated sufficiently high to destroy the seeds of such diseases as consumption, typhoid fever, cholera, and the like, but still not enough to injure its nutritive value.

Its use with infants and invalids is especially to be commended, as numerous testimonials from our records will show. During the past two years pasteurized milk has been sold on physicians recommendation in this city, and we have yet to learn of a single case where its use has been attended with unfavorable results. In a number of instances it has been used with great success as a *dernier resort* with ailing children where many other prepared foods had failed to afford proper nutriment. Of especial value is it in case of intestinal troubles of infants, as it possesses all of the necessary ingredients of a perfect food and in a condition perfectly free from any organisms of a baneful character.

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* Persons desiring fuller knowledge concerning the pasteurization of milk will find in Bulletin 44 of Wisconsin Agricultural Experiment Station (a copy of which will be sent upon application to the Station) further details concerning manipulation of apparatus, etc.

A careful study of the different germs found in pasteurized milk, as prepared at the University of Wisconsin creamery, as to their toxic properties, has not revealed a single form that is dangerous in any way.

It should be observed in closing, that while the process of pasteurizing is extremely simple it must be carried out under the closest supervision to give uniformly successful results.

No more fallacious idea could be gained than that any kind of milk can be successfully treated by this process. The fewer bacteria there are in the milk the less spores there will be, so that fresh milk that has been cooled thoroughly is best suited for this purpose.

Wisconsin Agr'l Expt. Station.

Common Salt Mixture.

Several years ago a number of objects of considerable historic interest were presented to the University of Wisconsin, School of Pharmacy, by Mr. E. Sumner of Madison, Wis. Among these were several war relics from Camp Randall west of the city. In addition to the barracks for Wisconsin volunteers a hospital for wounded soldiers was located at the camp. Many a story has been told and recorded about Camp Randall, but that something of pharmaceutical interest could be associated with the camp possibly occurred to no one until a few years ago several relics were discovered in a corner of the third floor of one of the drug stores of this city.

Two of the objects referred to are reproduced by the accompanying cut showing a large pasteboard box and a smaller tin box. The former bears the label of Edward R. Squibb, M. D., Brooklyn, N. Y.; the latter that of the U. S. A. Medical Dept. Contents and purpose of contents are best explained by the label of the larger box. It reads as follows:

Chlorinium.

The Common Salt Mixture.

Take of common Salt, well dried........1800 parts,
Binoxide of Manganese, containing 72 percent...1875 parts,

Grind them together into a fine powder and put the powder up in packages containing about 195 grains each and put 130 packages into a pasteboard box to accompany the Sulphuric Acid Mixture.

Each of these packages requires half a fluidounce of Sulphuric Acid Mixture, and yields about 57 cubic inches of Chlorine. This quantity when thus liberated gradually in a space containing about 20,000 times its volume of air, is borne without inconvenience by persons generally, and is not injurious, even in pulmonary diseases. As very much depends upon the ventilation of apartments wherein it is to be used no absolute rules of application can be laid down except that it should never be used in such quantities as to produce discomfort or bronchial irritation to patients.

Directions for Use.

One of the above packages or papers of the Common Salt Mixture placed in a saucer or plate and thoroughly mixed with half a fluidounce of the Sulphuric Acid Mixture is to be placed under every alternate bed at night and allowed to remain there three days. Upon the second night the beds which were omitted the first night should be supplied in the same way for the same length of time; and the whole process repeated at the end of three days or sooner according to circumstances. Should the wards be badly ventilated or contain many sloughing wounds, or be subject to epidimic disease or low forms of fever, the process should be continuous; that is, the mixtures should be renewed every third day. Otherwise once or twice a month may be sufficient. And, when thorough cleanliness and ventilation are attained the process is unnecessary for occupied wards.

In disinfecting unoccupied Wards, Water Closets, Latrines, etc., by Chlorine they should first be cleansed, be closed up as perfectly as practicable, and two packages used for each 600 cubic feet of space.

Prepared by
Edward R. Squibb, M. D.,
Brooklyn, N. Y.

The mixture was put up in packages of ten powders held together by a strip of blue paper, and sealed as indicated in the cut. Thirteen packages of ten powders each were contained in a drawer-like compartment taking up about one-third of the pasteboard box. The other two-thirds, or a space of 5'x5'x13' was allowed for the bottle containing the sulphuric acid. From the only box that was saved (the others had been used for disinfecting purposes during the past thirty years,) the acid bottle had been removed.

The label of the tin box reads as follows:

132 Papers
U. S. A. Medical Dept.
Prepared at the   Philadelphia,
U. S. A.   Pa.,
Laboratory,   1864.
Experientia et Progressus.

The character of the stamp or trade mark becomes apparent from the cut. The explanatory description is but an abstract of the other label.

The box, however, did not contain 132 papers as the label would indicate, but the powder in bulk and a small tin cup or ladle. Tin box plus contents weighed 3 lbs. 12 oz. The capacity of the spoon is ½ oz. of mixture. *E. K.*

TRANSLATIONS.

Remedies from the Animal Kingdom in use Formerly and at the Present Time.[*]

By *B. Seybold.*

In the year 1890, at the international medical congress at Berlin, much attention was attracted by the exhibition of Chinese medicaments by the firm of J. D. Riedel. Especially surprising to most persons were the several repulsive-looking remedies of animal origin there shown, and undoubtedly many of the spectators, proud of our present day culture, thought it fortunate that such things are unknown in our civilized countries.

But how long ago is it since our materia medica overflowed with all possible and many impossible remedial agents from the animal kingdom? Upon looking over old official price-lists, pharmacopœias, and other writings pertaining to medicines, we can obtain a fair idea of the extent to which these articles were used. Such remedies were in vogue in the oldest times of which we have any record. According to Berendes[1] the remedies from the animal kingdom played no small part among the ancients; Hindoos, Persians, Egyptians, Arabs, and Romans employed a large number, some of them extremely nauseating in character. Fewer were found among the Jews, and among the Greeks at the time of Hippocrates.

To show the number of remedies of animal origin used, a compilation from old price-lists and pharmacopœias, dating from the 16th to the 19th century, is here added:

Price-lists of	No. of remedies.	Of these were fats.
1564 Marburg	35	17
1582 Worms	116	38
1600 Helmstädt	96	31
1604 Liegnitz	68	31
1605 Mainz	56	36
1607 Schweinfurt	113	38
1611 Wittenberg	75	29
1612 Henneberg	70	32
1614 Schweinfurt	110	41
1617 Marburg	79	27
1618 Langingen	72	28
1623 Rinteln	68	23
1626 Frankfurt	80	30
1633 Görlitz	119	39
1644 Schweinfurt	112	34
1652 Dresden	190	58
1656 Marburg	120	41
1669 Leipzig	127	37
1684 Augsburg	87	30
1696 Erfurt	84	25
1745 Lübeck	111	29
1746 Brandenburg	105	29
1768 Erfurt	73	23
1770 Lübeck	98	22

Pharmacopœias contained:

1638	Pharm. Parisiensis	34	remedies.
1666	Dispensatorium Norimbergense	113	“
1672	Pharm. Augustana c. animadvers. Zwelferi	83	“
1731	Disp. reg. et electoral Boruss. Brandenburg	117	“
1732	Pharm. Parisiensis	90	“
1747	Disp. reg. et electoral Boruss. Brandenburg. Erfordiæ	97	“
1784	Pharm. Edinburgensis. Additament adpecit Baldinger Bremæ	48	“
1798	Pharm. Wirtenbergica edit. VI	107	“
1829	Pharm. Boruss. edit. V	18	“
1833	Pharm. Hanovera nova	19	“

From these statements can be seen how considerable a number of remedies were furnished apothecaries by the animal kingdom. A very large increase in number can undoubtedly be ascribed to the Thirty Years' war, for through it all nationalities were thoroughly mixed, and superstition, to which most of the remedies owed their application, was widely spread.

It may be a surprise to many, to learn that as late as 1776, a remedy, *meloe majalis*, was introduced into medicine, and that Frederick the Great, probably one of the most educated men of his day, bought this remedy from a peasant for an enormous sum; it was supposed to cure hydrophobia, and Frederick caused the remedy to be made publicly known. Even as late as the end of last century, a large number of these substances were still to be found in the pharmacopœias and official price-lists. For these reasons we can easily understand why even now such articles are called for in apothecary shops, and not only is it the lower classes who adhere to the use of such remedies; even in the higher walks of life do we find people still clinging to these superstitions.

The following list of remedies are taken from the above-named books, the large number of fats being first considered:

Axungia alcis,	fat from elks.
“ agnina,	“ “ lambs.
“ anatis,	“ “ ducks.
“ anatis silv.,	“ “ wild ducks.
“ anguillae,	“ “ eels.

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[*] From Apoth. Zeitung, No. 5, 1896. Translated for the Review by Richard Fischer, Instructor in Practical Pharmacy, University of Wisconsin.

[1] Berendes, Die Pharm. bei den alten Kulturvölkern.

Axungia anseris,	fat from geese.
“ apri,	“ “ wild boar.
“ ardeae,	“ “ bitterns.
“ canis,	“ “ dogs.
“ “ marini,	“ “ seals.
“ capreae,	“ “ goats.
“ ciconiae,	“ “ storks.
“ caponis,	“ “ capons.
“ castorei,	“ “ castors.
“ castoris,	“ “ beavers.
“ cati silvest.,	“ “ wild cats.
“ cervi,	“ “ deer.
“ coturnicis,	“ “ quails.
“ cuniculi,	“ “ rabbits.
“ cygni,	“ “ swans.
“ equi,	“ “ horses.
“ equorum de collis,	“ “ necks of horses.
“ erinacei,	“ “ hedgehogs.
“ felis,	“ “ cats.
“ gallinae,	“ “ chickens.
“ hirci,	“ “ bucks.
“ hominis,	human fat.
“ leonis,	fat from lions.
“ leopardi,	“ “ leopards.
“ leporis,	“ “ hares.
“ lucii,	“ “ pickerel.
“ lupi,	“ “ wolves.
“ muris montani,	“ “ marmots.
“ mustellae piscis,	“ “ burbots.
“ oculorum cervi,	“ “ eyes of deer.
“ de phasanis,	“ “ pheasants.
“ porci,	“ “ hogs.
“ serpentum,	“ “ snakes.
“ simiae,	“ “ monkeys.
“ struthio cameli,	“ “ ostriches.
“ sturionis,	“ “ sturgeons.
“ tarvae,	“ “ bustards.
“ tauri,	“ “ cattle.
“ taxae,	“ “ she-badgers.
“ taxi,	“ “ he-badgers.
“ thymali,	“ “ “Aschenschmalz.”
“ ungularum bovis,	Neatsfoot oil.
“ ursae,	fat from she-bears.
“ ursi,	“ “ he-bears.
“ viperae,	“ “ snakes.
“ vulpis,	“ “ foxes.
“ vulturis,	“ “ vultures.
Butyrum caprinum,	Butter from goat's milk.
“ foeminarum,	“ “ woman's milk.
“ majale,	“ made in May.
“ vaccininum reens,	Fresh butter.
Medulla agnina,	Marrow from lambs.
“ asinina,	“ “ donkeys.
“ capreolina,	“ “ roes.
“ caprina,	“ “ goats.
“ cervina,	“ “ deer.
“ equi,	“ “ horses.
“ hircina,	“ “ bucks.
“ hominis,	“ “ man.
“ taurina,	“ “ cattle.
“ vaccinina,	“ “ cows.
“ vervecina,	“ “ wethers.
“ vitulina,	“ “ calves.
Oesypus,	Wool fat.

Sebum caprinum,	goat-	tallow.
“ cervinum,	deer-	“
“ de dromedario,	dromedary-	“
“ hircinum,	buck-	“
“ hoedium,	kid-	“
“ ovinum,	mutton-	“
“ taurinum,	ox-	“
“ vaccininum,	cow-	“
“ vervecinum,	wether-	“
“ vitulinum,	calf-	“

Whether our ancestors were very happy when they had a dozen or more of these fats on hand is extremely doubtful.

At the head of all was the royal apothecary-shop of Dresden. The rarest things were there obtainable. Unfortunately, the catalogue gives us no information on the price of these rarities.

In enumerating all other remedies furnished by the animal kingdom, some notes are added pertaining to their collection and uses.

Aegagropilae,	Chamois excrement.
Album graecium,	White dog- “
Ambra grisea,	Amber.[2]
Apes combustae et siccatae,	Incinerated and dried bees.
Aranea,	Spider.
Aselli seu Millepedes,	Sow bug.[3]
Bezoar,	Bezoar.[4]
Blatta byzantina,	Indian muscle-shells.
Bufones exiccatae et ustae,	Dried & incinerated toads.[5]
Cancer fluviatil. usta,	Incinerated river lobster.
Cancer marin. usta,	“ sea “
Cantharides,	Spanish flies.
Capo,	Capon.
Carabus praeparat.,	Carabid.
Carnis animalium,	Meat.
Caseus mollis,	Soft cheese.
Castoreum,	Castor.[6]
Catellus,	A young dog.
Cera citrina,	Yellow wax.
Cera virginea,	Virgin wax.
Cerebella passerum,	Sparrow's brain.

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[2] Lonicer says: “Es schreiben auch etliche, dass die Ambra in der Tiefe des Meeres wachse und bei Sturm ans Land geworfen werde. Andere schreiben, es habe besondere Quellen, darinnen sie gefunden werde, gleichwie der Schwefel und Pech seine Quellen hat. Diese Ambra isset der Wallfisch einer, so Azelus wird genennet, so derselbigen ganz begierig nacheilet, und sich also daran überisset und überfüllet, und dass er daran stirbt, und auf dem Wasser liegen bleibt. Diess wissen die Fischer und haben Acht darauf, und ziehen ihn zu Land, hauen ihn auf und nehmen also die Ambra aus ihm.” See also Peters, Vol. II., p. 27.

[3] Dried sow-bugs (slaters) were extensively used to cure sore-throat, urinary calculus, and retention of the urine. As late as the beginning of this century they are found in some of the price-lists.

[4] See also Peters, Vol. II., p. 50.

[5] Toads were regarded as especially poisonous animals. Gessner writes: “Diese thier sind gantz schädlich und verletzlich mit jrem gifft: Dann so yemants mit jrem seich berürt | so solches ort faulen: und nit ohn grosse arbeit widerumb heilen. Innerhalb dem leyb ist sy tödtlich. Ir ankucken und gesicht ist schädlich | davon die menschen auch gantz bleych und ungestalt werden sollend.” Considering these properties it is small wonder that the toad was looked upon as so very venomous. Its head was pierced alive, after which it was dried in the shade or burned to ashes.

[6] Megenberg reports: “Aristoteles spricht das des pibers mannes gezeuglein haiz castoreum, das haist ze däutsch pibergail. Das pibergail ist ze vil erznei guot, und waent der piber, man jag in allain der gailn willen, das tier hât die Art, wenne ez der jäger jagt, sô peizt ez im selber sein gailn auz und laezt die liegen, wan es waent | daz man ez nicht jage danne durch der gailn willen.” Valentini refutes this fable. The same author mentions Danzig as the chief source at that time (1704). Adulterations were frequent even then.

Cerebrum hominis,	Human brain.
Cerebrum leporis,	Rabbit's brain.
Chelae cancrorum,	Lobster claws.
Ciconia usta,	Incinerated stork.[7]
Cingulum e corio cervino,	Buckskin straps.
Cingulum e corio humano,	Straps from human skin.[8]
Coagulum leporis,	"Hasenlippe."
Coagulum hoedi,	"Zickleinlippe."
Coccienellae,	Cochineal.
Colla piscium,	Isinglass.
Coluber,	Adder.
Concha fluviata,	River-shell.
" marina,	Sea-shell.
" venerea,	Venus-shell.
Corall. alb.,	White corals.
" nigr.,	Black corals.
" rubr.,	Red corals.
Cor cervi,	Deer's heart.
" leporis,	Rabbit's heart.
" vituli,	Calf's heart.
Cornu alcis,	Elk's-horn.
" caprae,	Goat's-horn.
" cervi,	Hart's-horn.
" hirci,	Buck's-horn.
" rhinocerotis,	Rhinoceros'-horn.
Cornua scarabaeorum,	Horns of a stag-beetle.
Corvi combusti,	Incinerated crows.
Cranium humanum,	Human cranium.[9]
Cremor lactis,	Cream.
Cuculus ustus,	Incinerated cuckoo.
Dentale,	Purple-fish.
Dens apri,	Wild boar's tooth.
" fibri,	Beaver's tooth.
" hippopotami,	Hippopotamus' tooth.
" hominis,	Human tooth.
" leporis,	Rabbit's tooth.
Dens lupae et lupi,	Tooth of she- and he-wolf.
" ursae et ursi,	Tooth of she- and he-bear.
" trutarum,	Trout teeth.
" vulpis,	Fox teeth.
Dorsa serpentum,	Spine of snakes.
Ebor,	Ivory.
Entale,	Tooth-shell.
Erinaceus combustus,	Incinerated hedgehog.[10]
Exuviae anguillae,	Eelskin.
Exuviae serpentum,	Snakeskin.
Fel acipitris,	Hawk-gall.
Fel caprae silvestris,	Roe-gall.
" hirci,	Buck-gall.
" leporis,	Rabbit-gall.
" lucii piscis,	Pickerel-gall.
" perdicis,	Partridge-gall.
" tauri,	Ox-gall.
" ursi,	Bear-gall.
Folia operculata cochlearum,	"Blätter von Schnekendeckeln."
Formicae,	Ants.
Guttur galli exsiccati,	Dried rooster's throat.
" lupi,	Wolf's throat.
Hepar anguillae,	Eel's liver.
" cervi,	Deer's liver.
" lupi,	Wolf's liver.[11]
" letrae,	Otter's liver.
" vituli,	Calf's liver.
Hirudines,	Leeches.
Hirudines usti,	Incinerated swallows.[12]
Intestina bovis,	Cattle intestines.
" cervi,	Deer intestines.
" lupi,	Wolf intestines.
" muscellae piscis,	Burbot intestines.
Lac asinae,	Ass's milk.
" caprinum,	Goat's milk.
" mulierum,	Woman's milk.
" vaccae,	Cow's milk.
Lacerta,	Lizards.
Lacrymae cervi sive moschus oculorum,	Musk of a hart.
Lana succida,	Dirty wool.
Lapis carpionum,	Stone from a carp.
" e bovilo fele,	Stone from the gall of cattle.
" lyncis,	Stone from a lynx.
" manati,	"Seekuhstern."
" percarum,	Stone from a ruff.
" porcor e ventriculis,	Stone from the stomach of a hog.[13]
" cancror.,	Crab's eye.
" trutarum,	Stone from a trout.
" urogallor, in ventr. eori invent.,	Stone from the stomach of a mountain-cock.
Lepus sicc. et usta,	Dried and incinerated hare.[14]
Lien bovis,	Spleen of cattle.
Limax,	Snails.
Lingua lupi,	Tongue of a wolf.
" vulpis,	Tongue of a fox.

(To be continued.)

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[7] Lonicer makes the following statement concerning the storks: "Von diesen Vögeln haben wir den Nutzen und Gebrauch der Clystire erlernet. Denn wenn sich die Storchen in dem Leib verstopft befinden | fassen sie den Schnabel voll Meerwasser und spritzen ihnen dasselbige zu den Aftern hinein | oder langen den Unrath mit dem Schnabel zu dem After heraus."

[8] Straps from human or deer's skin were tied around the body to relieve the pangs of child-birth. The straps from deer were obtained in a most cruel manner. Marshal states that according to a report of the Duchess Eleonore, a piece of skin, as broad as a hand and extending from the neck to the tail, was removed from the back of a live deer, after which the animal was given its freedom. This operation had to be performed on a Friday to make the magic effective. On the whole the deer played an important roll in medicine. Valentini mentions the following writings: Dissertatio v. D. J. A. Forck, De Cervo ejusque partibus in medicina usualibus; D. Graba, E aphographia curiosa; and D. Adam (Giessen), Disputat. inauguralis de osse cordis cervi.

[9] Only the skulls of executed persons or of those killed in war were effective. Valentini says that after the last war with the Turks, whole sacks-full of Turk-skulls were sold on the market at Leipsig.

[10] Megenberg writes: "Der Asch der geprant wird von einem igel und gemischt mit zelâzem pech oder harz, ist guot und pringet den masen ir hâr wider auf dem haupt oder an andern enden. Also spricht Plinius." This was then one of the oldest hair-restorers.

[11] Gessner says: "Die Wolfsläber wird mächtig gelobt zu den prästen der läber wird in etliche artzneyen von berümpten artzeten gesetzt."

[12] "Die ausgewachsenen Jungen der Schwalben werden unversehrt in einem bedeckten Tiegel zu Pulver oder zu einer schwarzen Asche verbrannt. Man schreibt dieser Asche eine besondere Wirkung gegen Fallsucht zu, auch wendet man sie bei Bräune und Entzündung der Mandeln, mit Honig vermischt, an." Pharm. Wittenbergica, 1760.

[13] Valentini also mentions a "pedra del porco," the stone from a porcupine. This, a brown stone, the size of a hazel-nut, came from the island Malaia in the East Indies and was very valuable. It was imported by the East India Company, who charged 132—275 Dutch guineas apiece for them. Through middle-men the price became 400—600 guineas. In Holland the stone was rented out at a duckat rental for 24 hrs. It was preserved in a perforated gold capsule, fastened to a gold chain. The author reports miraculous cures.

[14] Hares were very much used. Young ones were burned to ashes alive; with old ones the head and intestines were first removed. The ash was administered in wine, in cases of urinary calculus. The above-mentioned cloths were prepared in a most cruel manner. Hares were caught in the month of May, cut open alive, and the linen cloths dipped into the outflowing blood. After drying, the cloths were used as a cure in erysipelas.

MONTHLY REVIEW.

Pharmaceutical Technique.

A New Bunsen Burner.

Probably no form of apparatus employed by the chemist and pharmacist has been so often modified as the Bunsen burner, but in spite of this some improvements are still being constantly made. Most chemists have probably some time or other felt the want of a burner by means of which heat could be conveniently applied to a vessel from the side, without the extra use of clamps. This is especially the case during distillation, where it is often desirable to have a vessel beneath the flask, so that in case of the accidental breaking of the glass, the contents can be saved.

A burner that seems to lend itself well to this use has recently been patented by R. Dierbach, and can be procured from the firm of Kaehler and Martini, Berlin. The working of the burner can be readily understood from the accompanying figures, which show the apparatus in three different positions.

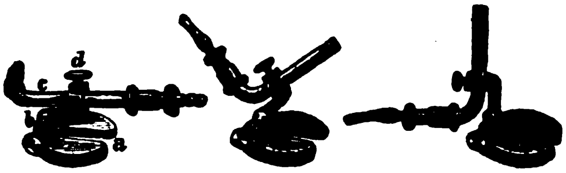


Fig. 1. Fig. 2. Fig. 3.

The burner consists of a mixing tube bent at right angles, the longer shank capable of being turned, or moved forward and back in the ring *d*. This ring is fastened to an iron plate by means of a hinge, so that by turning the hinge and moving in the ring, the tube can be made to assume almost any position. Besides this, as the portion to which the tubing is attached can be unscrewed and fastened to the other end, the function of the tube can be reversed.

Fig. 3 shows the tube in the ordinary position, in figure 2 it is slanting, while in fig. 3 the tube is placed horizontally.

[Ber. d. deutschen Pharm. Gesells., 1896, p. 76.]

Chemistry.

On the Alkaloids from Cacti.

The alkaloid pellotine isolated from *Anhalonium Wialliamsi* by A. Heffter has recently been more thoroughly examined by the same chemist. He now assigns to this alkaloid the formula $C_{13}H_{19}NO_3$, having made a careful study of its salts and other derivatives.

Anhalonium Lewinii Hennings is another cactus that is used by the Mexican Indians in the preparation of an intoxicating beverage. The dried sliced pieces of this cactus known as muscale buttons seem to constitute an important article of commerce. The word muscale appears to be a corruption of the Spanish Mezcàl = brandy from agaves. Lewin as well as Heffter have made several examinations of this interesting drug. The latter has now examined a larger amount of material obtained through Parke, Davis & Co. He isolated the following substances:

1.) Mezcaline, $C_{11}H_{17}NO_3$.
2.) Anhalonidine, $C_{12}H_{15}NO_3$.
3.) Anhalonine, $C_{12}H_{15}NO_3$.
4.) Lophophorine, $C_{13}H_{17}NO_3$; and prepared a large number of derivatives of each. [Ber. 29, p. 216.]

New Antiseptics.

Basing his experiments on the fact that metallic silver brought in contact with bacterial colonies exerts a germicidal effect on these, without destroying animal tissues, Dr. Credé has employed silver foil, covered with sterile gauze and cotton, as a dressing for aseptic wounds, especially those in which little secretion is expected. Wounds so dressed remained sterile for weeks, and healed more rapidly than when other dressings were used. Dr. Halsted has also made similar observations at the Johns Hopkins Hospital in Baltimore. Instead of silver foil, Credé has recently employed a gauze (manufactured by Max Arnold in Chemnitz, Ger.), to which the metallic silver is so firmly attached that the gauze can be handled and cut like other gauzes. In this form, it should readily find its way into practice, the more so since it can be kept indefinitely. Powdered silver, fastened to mull, furnishes another dressing, intended to replace iodoform gauze in the treatment of deep wounds. After having lain in wounds for 8 days, it was found to have retained its germicidal properties.

Under the name of Actol, the firm of Dr. Heyden, in Radebeul, (Ger.), puts on the market the lactate of silver, which according to Dr. Credé has valuable antiseptic properties. In solutions of 1:1000 it kills bacteria in 5 minutes, and in dilutions as great as 1:50,000 it retards their growth materially. The preparation is soluble in fifteen parts of water, is not caustic, and can be used either in powder or subcutaneously, in the latter case in doses not to exceed 0.1 g. As a gargle, a teaspoonful of a 2% solution of the salt in a glass of water may be employed.

Itrol, the name given to a preparation also manufactured by the above named firm, is the citrate of silver, and is intended to replace actol as a dusting powder, since it is less liable to form lumps than the latter. Since itrol is difficultly soluble (1:3800) its antiseptic powers are very lasting, and as it is not irritating in the least, it can be employed for all wounds. The powder is dusted directly upon the wounds, or made into a salve (1:50—100) with lard, vaseline or lanolin. An aqueous solution (1.4—5000) can be used for disinfecting hands, instruments, etc., while a solution of 1:5—10,000 furnishes an excellent gargle.

[Zeitsch. d. allg. österr. Apoth. Vereins, 1896, p. 276.]

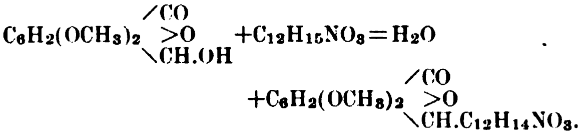
Fermentation of Cellulose.

Bacillus amylobacter, which has hitherto been regarded as the special ferment of cellulose, is really a collective species, including a large number of different butyric ferments. None of these has, says V. Omelianski, so far shown any marked power of decomposing pure cellulose. The special microbe of cellulose fermentation can be isolated by the method of elective cultures. Swedish filter paper and chalk are placed in a solution of potassium phosphate, magnesium sulphate, and ammonium sulphate, with a trace of ooze of the Néva. The flasks are hermetically closed and kept at 30—35°; fermentation is somewhat rapid, and the paper becomes yellowish, transparent, and gelatinous, and finally dissolves, some of the chalk dissolving at the same time. The ferment is found on the paper and not in the liquid; it is very thin, 6 to 7 μ long, and 0.2—0.3 μ broad, and forms very round spores, 1 μ in diameter. Further cultivations on potato are necessary, in order to obtain the bacillus quite pure.

[J. C. S., 70, p. 202; from Compt. rend., 121, p. 653.]

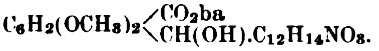
Synthesis of an Isomer of Narcotine.

While trying to obtain narcotine by condensation of opianic acid and hydrocotarnine Liebermann prepared an isomer of this opium alkaloid according to the following reaction:



$$C_6H_2(OCH_3)_2\begin{cases}CO\\ >O\\ CH.OH\end{cases} + C_{12}H_{15}NO_3 = H_2O + C_6H_2(OCH_3)_2\begin{cases}CO\\ >O\\ CH.C_{12}H_{14}NO_3.\end{cases}$$

Isocotarnine crystallizes from alcohol in prisms or needles. It is soluble in boiling benzene and is precipitated from the benzene solution by petroleum ether. The alcoholic solution is strongly alkaline. It melts at 194° without decomposition. Insoluble in ammonia, alkalies and alkali carbonates. Baryta water dissolves it upon prolonged boiling, forming barium isonarcotinate,



$$C_6H_2(OCH_3)_2\begin{cases}CO_2ba\\ CH(OH).C_{12}H_{14}NO_3.\end{cases}$$

After the barium has been precipitated as sulphate, soda solution precipitates regenerated isonarcotine. Isonarcotine is readily soluble in sulphuric and hydrochloric acids. The salts with hydrobromic and hydriodic acids are less soluble. The hydriodate is almost insoluble in cold water. The nitrate is also sparingly soluble.

Isonarcotine is not identical with gnoscopine, another isomer of narcotine isolated from opium by H. Smith. Isonarcotine can readily be distinguished from narcotine by the carmine color produced with concentrated sulphuric acid. Hydrocotarnine can be identified in the same way when opianic acid is previously added, or opianic acid, by first mixing it with hydrocotarnine. The same is true of cotarnine after it has been reduced to the hydrocompound with zinc and hydrochloric acid. [Ber. 29, p. 183.]

Ethyl Alcohol from the Fermentation of Asphodelus ramosus and Scilla maritima.

The tuberous roots of *Asphodelus ramosus*, which grows abundantly in the wild state in Algeria, were cut up and extracted with warm water by diffusion by G. Rivière and Bailhache. The solution was boiled, allowed to cool, mixed with 2 percent of lime, allowed to remain for 48 hours, filtered, and the excess of calcium precipitated with sulphuric acid; after removal of the calcium sulphate, the "solution" was limpid, and slightly amber colored. The exhausted cossettes were pulped, mixed with 2 percent of sulphuric acid, boiled in order to completely saccharify the starches, filtered, mixed with lime in quantity sufficient to leave an excess of 2 percent, and allowed to remain 48 hours. It was then filtered, neutralized with sulphuric acid, and, after separation of the calcium sulphate, mixed with the solution obtained in the first stage.

The mixed solutions were sterilized by successive ebullitions with two days interval, cooled, and mixed with pure yeast from the white wine of Burgundy. Fermentation begins almost immediately, and is complete in four or five days, distillation yielding a liquid with an alcoholic strength of 50° to 55°. The alcohol has the agreeable bouquet due to the yeast, and is free from the disagreeable odor that has hitherto characterised alcohol from the asphodel.

Scilla maritima, which also grows abundantly in the wild state in Algeria, when treated in a similar manner, yields an alcohol resembling wine brandy, and with the bouquet characteristic of the particular yeast.

The alcohol from *Scilla* has a flavor somewhat inferior to that of the alcohol from *Asphodelus*, and contains a higher proportion of aldehyde. Both, however, are free from furfuraldehyde, and contain only slight traces of higher alcohols.

[J. C. S., 70, p. 203; from Compt. rend., 121, p. 659.]

Solubility of Silver Halogen Salts in various Solvents.

The experiments of Valenta on the solubility of the silver salts of halogen acids in sodium thiosulphate and in potassium cyanide, indicate that the solubility is not that deducible from the equations (I) $3Na_2S_2O_3 + 2AgCl = (AgS_2O_3Na)_2, Na_2S_2O_3 + 2NaCl$ and (II) $2KCN + AgCl = KAg(CN)_2 + KCl$. Ernst Cohen has, therefore, examined these solubility phenomena with the following results. (1) Silver chloride, if not in excess, dissolves in sodium thiosulphate in accordance with equation I. (2) If the silver chloride is in excess, the less soluble salt $(AgS_2O_3Na)_2$ is formed. (3) If not in excess, silver chloride dissolves in potassium cyanide solution in accordance with equation II. (4) Excess of the silver salt causes the double salt to be partly decomposed, with formation of silver cyanide and potassium which can react in the reverse sense until equilibrium is reached, $KAg(CN)_2 + AgCl \rightleftarrows 2AgCN + KCl$. Valenta's results were due to the fact that he operated with a large excess of silver haloïd.

[Zeit. physikal. Chem. (1895), 18, p. 61.)

Botany and Pharmacognosy.

Opuntia vulgaris Mill.

Miss Bertha L. De Graffe in an article on the prickly pear, one of our widely distributed cacti characteristic of many sandy and rocky localities, gives the results of a study of the constituents of the plant, particularly of the fruit. A large percentage of sugars, albuminoids and mucilage was found; alkaloids, glucoscides and tannin were not present. This composition makes it easily understood why this fruit is a favorite article of diet among the Indians, who use it when fresh and dry it for winter use. The fresh, unripe fruit, after being boiled with water for ten or twelve hours, is allowed to ferment and furnishes a substance alike stimulating and nutritious.

[Am. Journ. Pharm., 68 (1896), p. 169.]

Action of Poisons on Plants.

F. W. Cord finds that water solutions of the irritant poisons, arsenic, corrosive sublimate, mineral acids, etc., are fatal to plants in a short time in very great dilutions. The neurotic poisons, strychnine, aconite, etc., were not fatal in the strongest doses used, 1/10 of one percent. Alcohol in a very strong solution was fatal.

It is interesting to note that a degree of concentration harmless when the neurotic poisons were used proved fatal with the irritant poisons. The reverse quantitative relation holds for animals.

[Am. Journ. of Pharm., 68, p. 218; from Garden and Forest.]

Formation of Indigo in Plants of the Order Indigofera.

According to van Lookeren and van der Been the extract of the leaves of the *Indigofera* shows an alkaline reaction with litmus and with rosolic acid, an acid reaction with phenolphtaleïn. When the leaves are "fermented" with dilute (0.5 to 1 percent) acids, solutions are obtained which yield indigo under the influence of atmospheric oxygen and behave similarly to the solutions obtained by reducing ordinary indigo, precipitating with dilute acid, extracting with chloroform, and taking up the residue with water. Such a solution cannot be obtained from pure indigotin.

Indigotin-white, together with indirubin-white, and other products formed from indican under the influence of enzymes in absence of air, behave differently, as regards solubility in water and chloroform and in the readiness with which they are oxidized, from indigo-white, either in pure state or mixed with indifferent substances. Indigo-blue containing so called indigo-brown is slightly soluble in presence of free alkali, whilst if indigo-red is present it is also soluble in alcohol; this explains why acid extracts contain indigo-white in solution.

[J. C. S., 70, p. 207; from Landw. Versuchs-Stat., 46, p. 249.]

The Location of the Active Principle of Rhamnus Purshiana D. C.

M. Eug. Cabannes discusses briefly the history of our knowledge of the active principles of *Rhamnus frangula* L. and of *R. Purshiana* D. C. and by use of the reaction of Borscow seeks to locate the active principles in the tissues.

When sections of *Rhamnus frangula* are placed in an alcoholic solution of potash, the cells containing frangulin quickly take on a cherry-red color. The cortical parenchyma, the bast and especially the medullary rays respond to the test.

Transverse sections of the bark of *R. Purshiana* when similarly treated show the coloration in the five or six layers of the bast most nearly adjacent to the cambium, in the medullary rays and in one or two layers of the cortical parenchyma.

Ammonia and the alkalis in general produce the same color reaction as the potash reagent.

[Repert. d. Pharmacie, 1896, p. 97.]

Ainu Medicinal Plants.

In the first part of an article on the medicinal plants of the Ainus, the inhabitants of the Kurile Islands, a group lying to the north of Japan, Rev. John Batchelor and Dr. K. Miyabe mention some interesting species and remedies.

The bitter roots of the Arikko (*Thalictrum aquilegifolium* L.) either raw or roasted are used for pains in the stomach. A strong decoction is sometimes used instead. The chewed root is bound to wounded parts to prevent suppuration. The bruised leaves are applied to bruises or contusions and to parts of the body suffering from internal pain. The bitter, dried root of Horap or Orap (*Peonia obovata* Maxim) when swallowed with water gives immediate relief from stomach-ache. When chewed to a paste, it is applied to aching joints. The seeds are chewed up and the expressed juice dropped into the eye as a remedy for sore eyes. Pains in the ears are eased by blowing the smoke from a mixture of tobacco and powdered seed into them.

Otompni-kina (*Chelidonium majus* L.) is used in a variety of ways. The stems and leaves softened by dipping into hot water are applied to painful bruises and contusions. It is believed to be an antidote for snake poisoning and the yellow juice is supposed to destroy warts.

Shikerebe-ni (*Phellodendron amurense* Rupr.) has a bitter, yellow inner bark which when bruised or dampened is bound to bruises and similar injuries to relieve pain. The berries are said to be a good expectorant as well as an article of food.

The poisonous root of Tokaomap (*Cicuta virosa* L.) when charred is used for external application for pains in the bones.

[Pharm. Journ., 1896, p. 147.]

Colchicum autumnale, L.

In a recent number of Die Natur, is a pleasing article by Dr. Karl Mueller on this interesting little plant. In the late summer and the autumn, from August to October, after most flowers have already gone, there appears the pale, flesh-colored flower (and the flower only) of the Colchicum. The early botanists were not a little puzzled to account for this leafless condition. It was, however, later seen that two years are necessary for this plant to complete its cycle of development. The first year produces from the underground corm, the flower, which is followed next year by the fruit and the foliage.

It is an interesting fact that during the year of flowering, not only in the corm-like underground structure but also in the other parts an extremely poisonous alkaloid is produced, namely colchicine, which combines with a bitter substance, colchiceine, and a sharp, volatile body, a fatty acid. These substances occur most abundantly in the rhizome at the time of flowering, whereas, during the fruiting year the starch may be eaten without harm. Because of these contents, the *Colchicæ* ally themselves, together with the group of the *Veratreæ*, to the monocotyledonous family *Melantheæ*.

The beautiful flower itself consists of a long, funnel-formed tube which runs out into six tongue-shaped divisions. It is composed of firm, flesh-colored tissues and has almost the smooth finish of porcelain, giving to the flower an aspect decidedly peculiar. Hence, perhaps, the popular name in some parts of Germany, *nackte Jungfer*, naked maiden. In the throat of the tube are the delicate stamens, with movable anthers and the styles hiding the future fruit. This consists of a rather large, compound capsule containing many round seeds.

Colchicum is used medicinally for rheumatism, gout and dropsy. [Die Natur, 44, p. 550.]

Practical Pharmacy.

Alkaloid-Stearates and their Therapeutic Applications.

Physicians not infrequently prescribe mixtures of alkaloids with fats and oils, for ointments or in suppositories. Undoubtedly these mixtures would be more effective, if the alkaloids were soluble in the fats and oils, which is not the case with the ordinary alkaloidal combinations. To remedy this defect, Françesco Zanardi has prepared the stearates of the alkaloids mostly used in this way; viz., those of morphine, atropine, and cocaine. The stearates are all soluble in fats and in petrolatum. Their properties and methods of preparation are given in the following:

Morphine stearate ($C_{17}H_{19}NO_3 . C_{17}H_{35}COOH$). Prepared by direct union of the components, or by double decomposition. According to the first method, equimolecular quantities of stearic acid (5.68) and morphine are allowed to react upon one another. The stearic acid is dissolved in a flask in 100 ccs. of absolute alcohol, by means of a gentle heat, and the morphine added in small quantities at a time. The warm solution is filtered, when upon cooling the morphine stearate crystallizes out. By concentration of the mother liquors, further yields can be obtained. The crystals are dried between 30° and 40° C.

A completely neutral stearate can be obtained by decomposing morphine hydrochlorate with sodium stearate.

The sodium stearate is prepared by adding to a warmed mixture of 5.68 g. finely cut stearic acid in 50 g. distilled water, 20 ccs. (= 0.8 g. NaOH) normal sodium hydroxide solution. To the resulting solution, 7.51 g. of morphine hydrochlorate, dissolved in 100 g. distilled water, is added. Upon mixing, the morphine stearate separates out as a bulky, white precipitate; this is collected on a filter and washed with water until the washings are no longer rendered turbid by hydrochloric acid, or by silver nitrate test solution after acidulating with a few drops of nitric acid. The stearate so purified is dried and re-crystallized from alcohol.

Morphine stearate forms white, shining, crystalline scales, unctuous to the touch and melting at 84—86°. At 100° decomposition sets in and at 150° the mass is blackened. In water, morphine stearate is practically insoluble; in cold alcohol it is only slightly soluble; in warm alcohol readily soluble. Ether dissolves but a small quantity; petroleum-ether, benzene, chloroform, and oil of turpentine, still less. In fixed oils it is soluble to about 1% at ordinary temperatures; fats and vaselin also dissolve it.

Stearic acid is tested for in this stearate by the addition of copper sulphate to the finely-divided substance suspended in water; the presence of morphine is proved by nitric acid and the other usual reagents.

By means of this stearate, containing 50.17% of morphine, we can prepare morphine "oil", morphine salves and morphine suppositories.

Atropine stearate ($C_{17}H_{23}NO_3 . C_{17}C_{35}COOH$). Prepared according to the same methods employed for the corresponding morphine salt.

It crystallizes in fine, white, shining needles, unctuous to the touch, melting at 120°, and decomposing at 170°.

The solubility of atropine stearate in various solvents does not differ materially from that of morphine stearate. Its atropine content is 50.43%.

The presence of stearic acid is proved as before with copper sulphate; the atropine is separated from the stearate by means of tartaric acid and tested for in the usual manner.

The solution of atropine stearate in oil of sweet almonds (0.1 : 50.0) furnishes an efficient substitute for hyoscyamus "oil" (D. A. III) and belladonna "oil". The stearate is dissolved in the oil, using a gentle heat. In place of extract of belladonna in suppositories and ointments, atropine stearate can find a rational employment.

Cocaine stearate ($C_{17}H_{21}NO_4C_{17}H_{35}COOH$). This substance is also prepared according to the above-mentioned methods. For 2.84 g. of stearic acid, 3.03 g. of cocaine are used.

Cocaine stearate crystallizes in white, shining needles, united in the form of bundles; melting-point about 90° C. It contains 51.63% cocaine. Solubility about the same as the above.

The tests for stearic acid are same as for the morphine salt; cocaine is identified by the usual reactions, after separation with tartaric acid.

[Apoth. Zeit., 1896, p. 141; from Bollettino chimico farmaceutico, 1896, 4.]

Tests for Sozoiodol-salts.

A. General Tests:

1. Upon heating sozoiodol-salts alone or with concentrated sulphuric acid, iodine is liberated; in the latter case, iodophenol with its characteristic odor is also formed. Bromine-water separates iodine from solutions of sozoiodol salts.

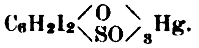
2. Upon heating with concentrated nitric acid, iodine is liberated, after the complete volatilization of which, yellow scales of picric acid separate out.

3. The aqueous solutions of sozoiodol-salts with a few drops of ferric chloride solution, yield an intense bluish-violet color changing to a reddish-violet, and upon heating with potassium chlorate and hydrochloric acid form chloranil (tetrachlorqninone), which separates in golden-yellow shining scales and can be recognized, even in very dilute solutions, by its characteristic and intense odor.

B. Special Tests:

1. Sozoiodolic acid comes on the market in small, prismatic, acicular crystals, readily soluble in water, alcohol, and glycerin. The tests for impurities are the same as those of the potassium salt.

2. Sozoiodolate of mercury appears on the market as a deep citron-yellow powder of extreme fineness, and with a constant mercury content of 32 percent, corresponding to the formula



$$C_6H_2I_2\left\langle\begin{matrix}O\\SO\end{matrix}\right\rangle_3 Hg.$$

Upon heating, the salt swells and rapidly volatilizes without leaving a residue. In water and alcohol it is practically insoluble. 0.5 g. of the salt however dissolve in 30 ccs. of a 5 percent solution of common salt; the freshly prepared solution should have no white or yellowish-white precipitate in suspension, nor show more than a slight turbidity. If 0.1 g. of the salt is dissolved with the aid of heat in 9 ccs. of water to which 1 cc. of nitric acid has been added, not more than a faint cloudiness should result after treating with a few drops of silver nitrate test-solution (chlorine). 0.2 g. of the salt are soluble in 20 ccs. of water acidulated with a few drops of hydrochloric acid. 10 ccs. of this solution should not be rendered cloudy by barium chloride test-solution (not more than 2–3 drops should be used), nor by dilute sulphuric acid (absence of sulphates and barium salts resp).

With ammonia, a solution of the salt in salt solution yields a yellowish or grayish white, with hydrogen sulphide, a black precipitate.

The quantitative determination of the mercury is accomplished by dissolving 2 g. of the preparation in salt solution, adding 1–2 drops of hydrochloric acid and precipitating with hydrogen sulphide. The resulting mercuric sulphide is collected on a tared filter, dried at 100° and weighed.

3. Potassium sozoiodolate is found on the market as a white, light powder, which swells very much upon heating on platinum-foil (resembling the so-called Pharoah's serpents); at the same time, the disagreeable odor of iodophenol appears.

It is insoluble in alcohol. 0.5 gms. of the finely powdered salt dissolve upon shaking with 50 ccs. of water at 15°.

Upon treating 20 ccs. of this solution with two drops of silver nitrate t. s., a white precipitate results immediately, which should be completely soluble in dilute nitric acid (concentrated acid is liable to liberate iodine). Not more than a faint opalescence should remain (traces of chlorine); a yellowish turbidity shows the presence of traces of free iodine in the preparation.

If a few drops of barium chloride solution (1:20) are added to 10 ccs. of the above solution, the resulting white precipitate (barium sozoiodolate) should dissolve completely upon warming, or upon the addition of ammonia (absence of sulphates). A few drops of dilute sulphuric acid added to 10 ccs. of the same solution should produce no turbidity (barium). Ammonium sulphide as well as hydrogen sulphide solution should produce no change in a solution of 0.5 gms. of the salt in 50 ccs. of water. Bromine water shaken with an aqueous solution (0.5 g. in 50 ccs.) of the salt should cause no turbidity (a cloudiness would indicate potassium phenolate as tribromphenol).

4. Sodium sozoiodolate appears in beautiful, white, prismatic needles, of an astringent taste at first, then sweetish. 1.0 g. is readily soluble in 20 ccs. of cold water, more soluble in warm water. In warm glycerin the solubility is about the same. In warm, especially in dilute alcohol (80 percent), it is soluble to about 50 percent. Upon heating it does not swell. The tests given for the potassium salt to prove absence of chlorides, sulphates, barium etc., also apply here.

5. Zinc sozoiodolate crystallizes in fine colorless needles, which do not swell upon heating. More soluble in alcohol than in water. The finely powdered salt is soluble in 50 p. of cold and in 20 p. of warm water, remaining in solution in the latter case upon cooling. 1 g. of this salt dissolves in 10 g. of alcohol at ordinary temperatures. The tests for purity are identical with those for the potassium salt, except that, of course, hydrogen sulphide and ammonium sulphide yield white precipitates.

6. The tests for the other sozoiodol-salts, viz: those of aluminum, ammonium, silver, lithium, magnesium, lead etc., are, in the main, the same as those before mentioned. [Trommsdorff's Laboratory.]

Physiology, Pharmacology and Therapy.

Poisonous Effects of Acetylene.

According to Nestor Gréhant a mixture of 20 vols. of acetylene, prepared from calcium carbide, 20.8 vols. of oxygen, and 59.2 vols. of nitrogen was breathed by a dog for 35 minutes without any marked disturbance, and 100 cc. of the blood was found to contain 10 cc. of acetylene. With 40 vols. of acetylene, the proportion of oxygen remaining the same, a dog died in less than an hour, owing to the failure of the heart's action, and 100cc. of blood contained 20cc. of acetylene. With 79 vols. of acetylene and 21 vols. of oxygen, the poisonous effects were still more strongly marked. It follows that acetylene may be fatally poisonous when present in proportions as high as 40 percent by volume.

A mixture of coal gas with air and oxygen containing 20.8 percent of the latter and 1 percent of carbonic oxide was nearly fatal to a dog after it had been breathed for about 10 minutes, and 100 cc. of the dog's blood contained 27 cc. of carbonic oxide. It follows that acetylene is much less poisonous than ordinary coal gas.

Berthelot, in some experiments made many years ago, in conjunction with Claude Bernard, found that acetylene, when present to the extent of a few percent by volume, is without injurious effects on birds. The poisonous properties often attributed to this gas, as prepared by the older methods, are probably due to the presence of carbonic oxide or hydrogen cyanide.

Moissan finds that when acetylene is prepared from pure calcium carbide, and is purified by being liquified, it has a very ethereal odor, and can be breathed in small quantity without evil effects. If, however, the calcium carbide has been prepared from coal and impure lime, it may contain calcium sulphide and phosphide, and the acetylene prepared from it then has a very disagreeable odor.

[J. C. S., 70, p. 200; from Compt. rend., 121, p. 564; ibid., p. 566.]

Derivatives of Hydrastine and Narcotine.

According to Edmund Falk, methylhydrastamide produces, in both cold- and warm-blooded animals, peripheral paralysis. In large doses, it paralyses the heart; it dilates the vessels, lowers the blood pressure, and causes death by cessation of respiration.

Methylhydrastimide acts on the muscular tissues producing paralysis preceded by cramps; even in small doses it weakens the heart. There is dilation of the vessels, and death occurs, as in the former case.

Methylnarcotamide produces a narcotic state by acting on the cerebrum, and there is paralysis of a peripheral nature. Very large doses are necessary to affect the heart; there is a fall of blood pressure. Respiration is first quickened, then becomes slower, and finally ceases, Methylnarcotimide is a narcotic, but paralysis is incomplete and accompanied by a stage of muscular cramp; on the heart, however, its paralysing action is more marked. It is a local anaesthetic at the seat of application. There is a fall of blood pressure. Respiration rises during the convulsions, but in the narcotic stage falls, and finally ceases.

[J. C. S., 70, p. 201; from Virchow's Archiv, 142, p. 360.]

In Memoriam.

Prof. Jean Mueller.

Professor Mueller, formerly professor of botany at the University of Geneva, and known as Mueller Argoviensis (from the canton Aargau, his former home) in distinction from other botanists of the same name, died recently in Geneva, Switzerland. His principal work is a monograph on the family *Resedaceae*. For Martius' Flora Brasiliensis he wrote the chapters on *Apocynaceae*, *Euphorbiaceae* and *Rubiaceae*, and for Decandolle's Prodromus the chapter on *Resedaceae*. Besides the university professorship Mueller occupied the position of curator of the city herbarium and of director of the botanical garden.

Dr. Chas. O. Curtman.

The sad news of the death of Dr. Chas. O. Curtman of St. Louis has just been received. Dr. Curtman was well known in medical circles as Professor of Chemistry at the Missouri Medical College. To pharmaceutical readers he is familiar as a writer on analytical chemistry. Back volumes of the Pharmaceutical Review contain many articles on analytical subjects from his pen. It may be less generally known that he was one of the most active members of the Committee of Revision of the last U. S. Pharmacopœia, being chairman of the committee on inorganic chemicals.

His recent illness was known to some of his friends, but the news of his death on the 22nd of last month was a sad surprise to all who had in mind his robust form and constitution.

Literary.

Books and Pamphlets Received.

Wilhelm Braumüller—Wien. Handwörterbuch der Pharmacie. Pracktisches Handbuch für Apotheker, Aerzte, Medicinalbeamte und Drogisten. Herausgegeben von A. Brestowski. Zwei Bände. 242 (Schluss-) Lieferung. 1895. M. 2.40.

Bibliographisches Institut — Leipzig. Meyers Konversations-Lexikon. 5. Aufl., Bd. 11. Langenbeck bis Mauri. 1076 Seiten mit zahlreichen Illustrationen. 1896.

A. Hartleben's Verlag — Die Cyan-Verbindungen. Ein Handbuch für Fabrikanten, Chemiker, Aerzte, Apotheker, Drogisten, Galvaniseure, Photographen, etc. Nach den neuesten Erfahrungen bearbeitet von Dr. Friedrich Feuerbach, technischer Chemiker. Ein Bd., pp. XVI, 400, mit 25 Abbildungen.

Herman Heyfelder — Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie. Herausgegeben von Dr. Emil Jacobsen. 34. Jahrgang. Zweites Halbjahr. Erste Hälfte. Mit in den Text gedruckten Illustrationen. 1895.

Ginn & Company — Boston. Chemical Experiments, General and Analytical. For use with any text-book of chemistry, or without a text-book. By R. P. Williams, Instructor in Chemistry, English High School, Boston. One Vol., pp. XIII, 102, with tables and illustrations.

Chr. Herm. Tauchnitz — Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lief. 10. 1896. M. 1.50.

Field Columbian Museum — Chicago. Flora of West Virginia. By Charles Fr. Millspaugh and S. W. Nuttall. Botanical Series, Vol. I, No. 2, pp. 69—276, with three plates.

Am. Pharm. Assn. — The National Formulary of Unofficial Preparations. Revised Edition. By authority of the American Pharmaceutical Association. One Vol., pp. XIII, 104. Cloth. 1896.

Lea Brothers & Co. — Philadelphia. The National Formulary. New and revised edition. Supplement to the National Dispensatory. Brochure, pp. VIII, 115. 1896.

Pharm. Review Publ. Co. — Milwaukee. Popular German Names of Domestic Drugs and Medicines. Compiled by Dr. Fr. Hoffmann. Revised and enlarged edition of 1892. Pamphlet, pp. 36. 1896. $0.50.

Schimmel & Co. — Leipzig. Bericht, April 1896. Brochure, pp. 87, with a map.

Maryland State Pharmaceutical Association — Baltimore. Thirteenth Annual Proceedings. Baltimore, May 7 and 8, 1895. Including President's Address, Reports of Committees and Papers read, also List of Officers and Members, Constitution and By-Laws, Pharmacy Law for Baltimore, etc. Brochure, pp. 58, with one photogravure plate.

Authors — Leipzig. Ueber Geraniol und Rhodinol. Von J. Bertram und E. Gildemeister. Pamphlet, pp. 13.

University of Wisconsin — Madison. Agricultural Experiment Station.* Bulletin No. 49. The Maintenance of Soil Fertility: Commercial Fertilizers. By F. W. Woll.

—— Bulletin No. 50. The Hot Water Treatment for the Prevention of Smut on Oats, Wheat and Barley. By E. S. Goff.

Vanderbilt University — Nashville, Tenn. Announcement of the Department of Pharmacy, 1896—97. Pamphlet, pp. 27.

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* The Bulletins and Annual Reports of this Station are sent free to all residents of Wisconsin upon request.

Robert Clarke Company—Cincinnati. Etidorhpa; or The End of Earth; the strange history of a mysterious being, and an account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. Fourth edition. 1896. $2.00.

Central Tennessee College — Nashville, Tenn. Catalogue of 1895—96 and Announcement for 1896—97 of the Meharry Medical, Dental, and Pharmaceutical Departments. Pamphlet, pp. 24.

Zweiundvierzigster Jahresbericht des germanischen Nationalmuseums. 1895.

E. Merck — Darmstadt. Bericht über das Jahr 1895. Herausgegeben im Januar 1896. No. 126.

—— Annual Report on the Year 1895. Published in March 1896. No. 128.

Dr. Peters and Rost — Berlin. Preisliste über Apparate und Utensilien für Chemie, Electrochemie, Pharmacie, Bacteriologie, Hygiene, Mikroskopie, Berg- und Hüttenwesen, Physik, etc. Ein Bd., pp. 480, mit zahlreichen Illustrationen. 1896. M. 3.00.

Parke, Davis & Co. — Detroit. Price List, 1896. Brochure, pp. 268.

Reviews.

Etidorhpa; or The End of Earth; the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. The Robert Clarke Company, Cincinnati. 1896.

Since the appearance of the author's limited edition of Etidorhpa barely five months ago the demand for the work has been so great that a second and a third edition have been exhausted as soon as prepared, and a fourth is now before us.

In a review of the first edition* it was said: "The work is suggestive, not didactic. . . . . The nature and direction of the thoughts that it arouses will be determined by individual tendencies." The truth of this assertion has been shown by the diversity of the published comments on the book. As a rule, specialists in science have been most impressed by hints in the direction of their individual lines of work; those of a philosophical turn of mind have found the metaphysical speculations of great interest; and theologians and moralists see promise of future possibilities in religious thought and bestow high praise on the temperance lecture, Chapters 36—39.

The present time is particularly opportune for a book of this kind. Not only are all departments of science at least normally alert and active, but the discovery of argon and of the action of the X-rays have awakened popular interest in the possibility of other equally wonderful revelations. In view of the fitness of the time and the excellence of the work it would not be strange if the success that Etidorhpa has so far achieved were but the beginning of what is to follow.

It is extremely fortunate that the work which seems more than any other to gratify the desire for a stimulus in scientific speculation is not based wholly on narrow materialistic and commercial ideas. Although the material importance of advance in science receives due attention, as in the chapter on the Food of Man, there is none of the spirit that coupled with the first announcement of Prof. Roentgen's discovery the statement that it furnished a means of identifying paste diamonds and of detecting flaws in armor plate. While the basis of the book is wholly scientific and there is an entire absence of gush and sentimentalism, the point of view is that of one who looks toward higher, not toward lower things. Many of the conceptions, though approached from the scientific side and expressed in a scientist's way, are in essence intensely poetic. The book may do something toward correcting the impression that to have the scientific spirit is to think on what one shall eat and drink, and wherewithal one shall be clothed, and perhaps to speculate a little on the dullest and least profitable metaphysical questions.

While considering the book as a general stimulus to thought, the reader must not forget that the separate parts express the results of careful speculation in various lines of science. Though the author obviously does not accept the exact theories put forward, except so far as they are at present capable of proof, he does indicate his belief that research along the lines of study discussed will yield startling results; and some of his strange statements may perhaps be considered as conjectures of what future discoveries may be. As years go by the possessor of a copy of Etidorhpa will take pleasure in seeing how far these hinted prophesies are fulfilled.

The fourth edition is from the same plates as the first, and paper, presswork and binding are very good. Those who have seen earlier copies will regret that the exquisite picture of Etidorhpa has been replaced by a much more common-place conception; though the latter is well-executed. A new portrait of I-Am-The-Man appears as frontispiece. The special preface to the author's edition and extracts from many reviews are found at the end of this volume. Students of pharmacy, chemistry and related subjects may be interested to know that Prof. Lloyd has dedicated the proceeds from the sale of commercial editions of Etidorhpa to the enlargement of his famous library.

William B. Cairns.

The Year-Book of Treatment for 1896. A critical review for practitioners of medicine and surgery. Published by Lea Brothers & Co., Philadelphia. One vol., 12 mo., pp. 484. 1896. $1.50.

A dozen times the Year Book of Treatment has appeared before its American admirers, reflecting the progress of British Medical thought. Those who have walked the hospitals of London find the views of their old teachers expressed on all practical subjects. Suffice it to enumerate a few of the themes that have been carefully reviewed. The Nauheim method of treating chronic heart affections is called attention to at length. Every practitioner in this country ought to read that article, as our literature is scanty. The article on thymus feeding in Graves disease, on nucleins in pulmonary troubles, on the Flechsig method of treating epilepsy, on tetano-antitoxin, on the gouty heart, on diphtero-antitoxin, on massage and early mobilization in the treatment of fractures, and the ambulant treatment of fractures of the lower extremities, on the surgery of the gall-bladder, on surgical treatment of idiocy, on castration in the treatment of hypertrophy of the prostate, and many more, suffice to show the progressive tendency of the Year Book. The subject of the supervision of tubercular patients by the local board of health, gives food for reflection for all health-officers. Stringent laws ought to be enacted to control this great scourge. Every active practitioner will welcome the Year Book, and the druggist will find a careful estimate of the therapeutic value of all the newer drugs.

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* Pharmaceutical Review, 14, p. 24.

F. R. Weber.

Meyer's Conversations-Lexicon. Ein Nachschlagewerk des allgemeinen Wissens. 5te, gänzlich umgearbeitete Auflage. 11ter Band. 1076 Seiten. Langenbeck bis Mauri. Bibliographisches Institut, Leipzig und Wein. 1896.

Das in früheren Besprechungen über dieses wohlbekannte Werk gesagte gilt auch für den 11ten Band. Derselbe enthält unter anderen grösseren Artikeln solche über Lebensversicherungswesen, Leder, Lehrfreiheit, Lehrlingswesen, Leibniz, Leipzig und die Leipziger Neubauten, Lessing, Leuchtgas, Leuchthürme, Licht, Linné, Linoleum, Linse, Lithographie, Locomobile, Locomotive, London, Louisiana, Lübeck, Luft, Luftpumpen, Luther, Madagaskar, Madras, Madrid, Magdeburg, Magen und Magenkrankheiten, Magnetismus, Mähren, Mailand, Malaiischen Archipel, Malerei, Marine, Markthallen, Maschinen, Maasse, Mathematik. An Chromobildern enthält der Band nur zwei, dagegen eine beträchtliche Zahl trefflich ausgeführter Städtepläne in Farbendruck. *Fr. H.*

Die Vegetation der Erde. Sammlung Pflanzen-geographischer Monographien. Herausgegeben von A. Engler und O. Drude. Bd. 1: Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel. Von Prof. Dr. Moritz Willkomm. Ein gr. Octavband. Mit 2 Karten, 2 Heliogravueren und 21 Textabbildungen. 1896. M. 12.00

Prof. Griesebach's well-known sketches "The vegetation of the earth" have been a standard work for more than one generation; but since the time when this excellent treatise was written the knowledge of the plants of the earth and of their geographical distribution and botanical relation has been much extended on the one hand and specialized on the other. Many accomplished botanists in the various countries have assiduously compiled and published special monographic "floras" of whole countries or of certain parts of countries, or of certain large groups or families of the higher or the lower plants. But few have endeavored to treat the vegetation of large areas and whole countries from a more commanding point of view so as to bring the separate sketches with a broader grasp into a general, uniform aspect. Two of the foremost botanists of our day have undertaken this difficult venture and propose in the course of years to offer a series of treatises on the distribution of the vegetation of the earth grouped in accordance with the geographical and topographical characteristics and division of the various continents. It is but natural that the most thoroughly studied and known main groups of the European continents are at first taken into consideration in this elaborate sketch, which will appear in independent volumes. The first one, treating the vegetation of Spain and Portugal, facing along its southern coast the long-stretched shores of the African continent with so many plants common to both floras, has just been issued. Its author, the well known botanist, Prof. Willkomm, late Professor at the University of Leipzig, has made the vegetation of these largely mountainous countries a life-long study and at his recent death has left this elaborate work as an enduring monument to his faithful and successful labors.

The volume is divided into three parts and each into various chapters. The introductory part consists of a masterly sketch of the history and the literature of the botanical study of the Iberian peninsula as far back as the 16th century. The first part of the book is divided into two large groups, treating on the physical geography of the peninsula, and on the distribution of the various plant formations over the different areas of the mountainous uplands and the lowlands of the peninsula. The second part includes descriptions of the various formations of the vegetation in general as well as for special districts. A most interesting concluding chapter treats of the changes brought on in the characteristics of the vegetation of the Iberian peninsula by migration as well as by the cultivation of plants.

This first volume of the series of sketches on the vegetation of the earth argues well for the importance, the excellence, and the paramount value of this new venture in botanical literature. The fact that two so eminent botanical scholars and one of the foremost botanical publishers have joined in the publication of a descriptive series of geographic-botanical sketches is an ample guarantee that the subsequent volumes will equal if not surpass the just issued initial volume. And this one is in every respect an excellent work which at once will command the interest and the appreciation of professional as well as of amateur botanists everywhere, and not least in the United States.

Fr. H.

Formulaire des Medicaments Nouveaux pour 1896. Par H. Bocquillon-Limousin, Pharmacien de 1re classe. 7e edition, revué, corrigée et augmentée. Librairie J. B. Baillière et Fils, Paris. 7 vol., de 300 pages, cartonné, 3 fr.

In these days of new remedies, when scarcely a week passes without the discovery of some synthetic preparation of greater or less therapeutic value, any book on new medicaments must necessarily be subject to frequent revision, if it is expected to serve the purpose for which it was intended. So the sixth edition of the "formulaire de medicaments nouveaux" has been soon succeeded by the present volume, in which many articles recently introduced into medicine have been added.

This last edition contains 455 new remedies, including crude drugs, plant constituents, and inorganic medicines, as well as synthetic organic preparations. Under each of these articles the author gives, as completely as possible in a work of this kind, the synonyms, description, composition (active principles as far as known in case of vegetable drugs), physiological action, therapeutic properties, mode of administration, and doses. To show that the work is up to date, it need only be mentioned that apolysin, citrophene, and ferripyrin are included in the list of remedies. On the other hand, it cannot fail to surprise or at least to interest American pharmacists to learn that drugs so long and so well known to us as hydrastis, cannabis indica, gelsemium, etc., are classed in the same category.

The paper and binding of the book are excellent for a work of its kind. *R. Fischer.*

Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lieferung 10. Chr. Herm. Tauchnitz, Leipzig. 1896. M. 1.50.

Lieferung 10 of this excellent work describes and figures Ergot, *Claviceps purpurea* Tulasne, together with the forms of *Ustilago* that attack the common cereals; the seeds of the corn cockle, *Agrostemma Githago* L., and of the cow-wheat, *Melampyrum arvense* L., frequently found as impurities in seed grain; the common pea, *Pisum sativum* L.; the common beans, *Phaseolus vulgaris* Metzg. and *P. multiflorus* Willd., and the lentil, *Evum Lens* L. A comparative study of the seed envelopes of the most important *Phaseolus* and *Vicia* forms from authentic specimens furnished by Prof. Wittmack of Berlin is a valuable feature of this number. By means of micrometric measurements of the elongated palisade cells, representing the epidermis of the outer integument of the ovule, and of the next underlying cell layer, taken in connection with the often characteristic form of the elements, the authors are able to identify a fragment from the seed coats of any of the dozen forms considered. Starches from the commoner grains are treated. A brief statement of our knowledge concerning the structure, growth and use in the plant preceeds the detailed description of starch from wheat, rye, barley, corn, oats and rice. As would be expected in this publication, full and clear descriptions are accompanied by excellent illustrations. *Rodney H. True.*

Die Cyan-Verbindungen. Ein Handbuch für Fabrikanten, Chemiker, Aerzte, Apotheker, Droguisten, Galvaniseure, Photographen, u. s. w. Nach den neuesten Erfahrungen bearbeitet von Dr. Friedrich Feuerbach, technischer Chemiker. A. Hartleben's Verlag, Wein. Ein Bd., pp. XVI, 400. Mit 25 Abbildungen. 1896. M. 6.00.

The Cyanogen Derivatives constitutes volume 224 of the Chemico-technical Library published by A. Hartleben of Vienna. Other volumes of this series have repeatedly been reviewed in the older volumes of this journal. In truly German fashion the author begins by giving in his introduction a very interesting historical account of the discovery of cyanogen compounds and of the development of our knowledge concerning this interesting group of chemicals. Although the industry of cyanogen compounds had received a severe check in its development through the introduction of coal-tar dyestuffs the manufacture of potassium cyanide has recently been greatly increased on account of the application of this chemical in the extraction of gold by means of the cyanide process in the most important gold districts.

The general part, which constitutes about two-thirds of the book, discusses in seven chapters the general properties of the cyanogen compounds; hydrocyanic acid and its salts; other methods for the preparation of cyanogen compounds; cyanic acid and its derivatives; thiocyanic acid and derivatives; ferro- and ferricyanides; the examination and valuation of cyanogen derivatives.

The second part discusses the technical application in several chapters: the effect of cyanogen derivatives on the human organism and the precautions to be taken in using them; application of cyanogen derivatives in reproduction processes; in galvanic plating; the extraction of gold by means of the cyanide solution. It thus becomes apparent that the book is of interest not only to the technical chemist, but to the druggist, the photographer and others who have some knowledge of chemistry. Many practical formulas for photographic reproduction and galvanic plating with copper, silver, gold, etc. are given.

The appendix supplies information regarding reagents and indicators, etc. The book is provided with an index. Paper, type and illustrations are of the same good quality that have characterized the earlier volumes of this series.

E. K.

Chemical Experiments, General and Analytical, for use with any Text-book of Chemistry, or without a Text-book, by R. P. Williams, Instructor in Chemistry, English High School, Boston. Ginn & Company, Boston.

This is a book of something over two-hundred pages, each alternate page being blank for notes, the first half of which is devoted to experiments in general chemistry, and the last half to tables for qualitative analysis.

The author has succeeded fairly well in the experiments given. He has aimed first, to select such as are most instructive and best illustrate the subject without being too elaborate; second, to arrange them in an order calculated to lead up by the most natural and easiest steps to a knowledge of the science; third, to make the subject fascinating by giving just enough information and suggestion to interest the experimenter and to make him work for the knowledge to be gained.

The orthography recommended by the A. A. A. S. is adopted throughout the book.

The author in his preface says, "Metal analysis has received a somewhat unique treatment. Each metal of a group is first taken separately and the analytical reactions are given. This method shows the pupil at once why a given reagent is added, and what its effect is. The group is next treated in the same way. This method clarifies the subject greatly in the pupil's mind, and is believed to be a valuable departure in teaching analysis."

The multiplication of laboratory manuals within the last decade is the, perhaps somewhat natural, result of the recognition of the fact that it is unwise to attempt the study of this science without laboratory instruction. This recognition is a great point gained in science teaching, and no high school worthy the name but has its fairly well-equipped laboratory. So far as the work before us gives instruction in general chemistry it will doubtless find a warm welcome from many teachers.

Of the analytical part the reviewer cannot speak so favorably. It is doubtful if any study leads more easily to "rule of thumb" methods of work or to habits of empiricism than does qualitative analytical chemistry as ordinarily taught. In the opinion of the reviewer, the methods of this book are such as will lead the student to feel he has accomplished his purpose when he can state with certainty the composition of the salt given him for analysis. The ability to write chemical equations or to analyze a salt does not necessarily indicate a training in logical methods of thought. But if chemical analysis is to hold a place in any scheme of education it must do so because of its value in training pupils to draw logical conclusions from observed phenomena. The more prominent faults of the analytical portion of this book are first, the want of sufficient explanatory text, and the giving of far too many tests for a single element. *W. W. Daniells.*

Bericht von Schimmel & Co. (Inhaber Gebr. Fritzsche) in Leipzig. Fabrik äther. Oele, Essenzen und chem. Präparate. April 1896.

In addition to the customary interesting information the new number of this semi-annual contains very valuable information concerning the so-called essences: bergamot oil, lemon oil and orange oil. The commercial confusion and uncertainty with regard to these products was possible on account of the generally prevailing ignorance with regard to the same. Mr. Karl Fritzsche, a son of the senior member of the firm, assisted by several consuls—among them by Mr. Nicola Siles, U. S. Vice Consul in Reggio—has spent about four months in the essence-producing districts and has made a careful study of the entire subject. The importance of the subject is manifested by figures speaking for themselves. The methods of examination worked out by the chemists of the firm are finding their way more and more into practice, so that adulteration will soon become impossible. The local consuls and government officials are taking an interest in the matter.

The report is also a valuable contribution to the geographical phase of pharmacognosy, which is still so sadly in need of more and authentic information. When the English translation of the Bericht appears the Review will as usual abstract paragraphs and chapters that are of special interest. *E. K.*

The National Formulary. Issued as a supplement to The National Dispensatory, 5th Edition. Lea Brothers & Co., Phila. Brochure, pp. 8, 115. 1896.

The most noticeable change in this publication is the introduction of the metric system of weights and measures, bringing it in conformity with that of the Pharmacopœia and scientific usage in general. The main additions to the list of formulae presented, besides those dropped from the text of the pharmacopœia are Compound Digestive Elixir, Elixir Paraldehyde, Stronger Emulsion of Oil of Turpentine, Glycerite of Guaiac, Solution of Bromide of Gold and Arsenic, Compound Powder of Acetanilid and Compound Syrup of white Pine. The formulae dropped from this edition are those of preparations admitted to the Pharmacopœia at its last revision.

Among the changes are noticed that of Elixir Gentian, Elixir Cinchona and of Chloroform Anodyne. Iron preparations with Elixir Gentian prepared according to the new formulae will not be discolored. In Chloroform Anodyne morphine sulphate is substituted for the Deodorized Tincture of Opium and the Tincture of Belladonna omitted. The title of this preparation has accordingly been changed from Mistura Chloroformi et Opii to Mistura Chloroformi et Cannabis Indicae Composita.

Other changes in title are those of the Effervescent Salts to Effervescent Powders.

Leo C. Urban.

Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie, mit Hinweis auf Maschinen, Apparate und Litteratur. Herausgegeben von Dr. Emil Jacobsen. 34. Jahrgang. 1895. Zweites Halbjahr. Erste Hälfte, pp. 184. Mit in den Text gedruckten Illustrationen. R. Gaertner's Verlagsbuchhandlung (Hermann Heyfelder), Berlin. 1896.

Attention has repeatedly been called to this quarterly, which supplies the technical chemist with a compilation of almost everything in which he may be interested. The quarterly brings not only abstracts of chemical articles, but also furnishes references to machines, apparatus and chemical literature. The present number contains abstracts arranged under the following groups:—

Buildingmaterials, cements, artificial stones.
Dyestuffs, dyeing and textile printing.
Fats, oils, illuminating materials and fuel.
Fermented beverages.
Tanning, the manufacture of leather and glue.
Textils.
Glass and earthenware.
Wood and horn.
Caoutchouc and guttapercha.
Cements and adhesives.
Lacquers, varnishes and paints.
Metals.

Part two will begin with food-stuffs and beverages and end with new books. The Repertorium, therefore, covers a large ground. It collects from a host of journals practically everything of interest to the technical chemist, and arranges the material for ready reference. It is a *multum in parvo* for the busy chemist and is of special importance to those who have only a limited number of chemical journals at their disposal. *E. K.*

Popular German Names of Domestic Drugs and Medicines. Compiled by Dr. Fr. Hoffmann. Revised and enlarged edition. Pharmaceutical Review Publ. Co., Milwaukee. Pamphlet; 36 pages; 50 cents.

This pamphlet which is a reprint of the one published by Dr. Hoffmann in 1892, has already become deservedly popular among pharmacists. As its name implies, it is an alphabetical list of German domestic remedies in use in this country, together with their Latin names, and references to formulas of the rarer preparations occurring in the list. *R. Fischer.*

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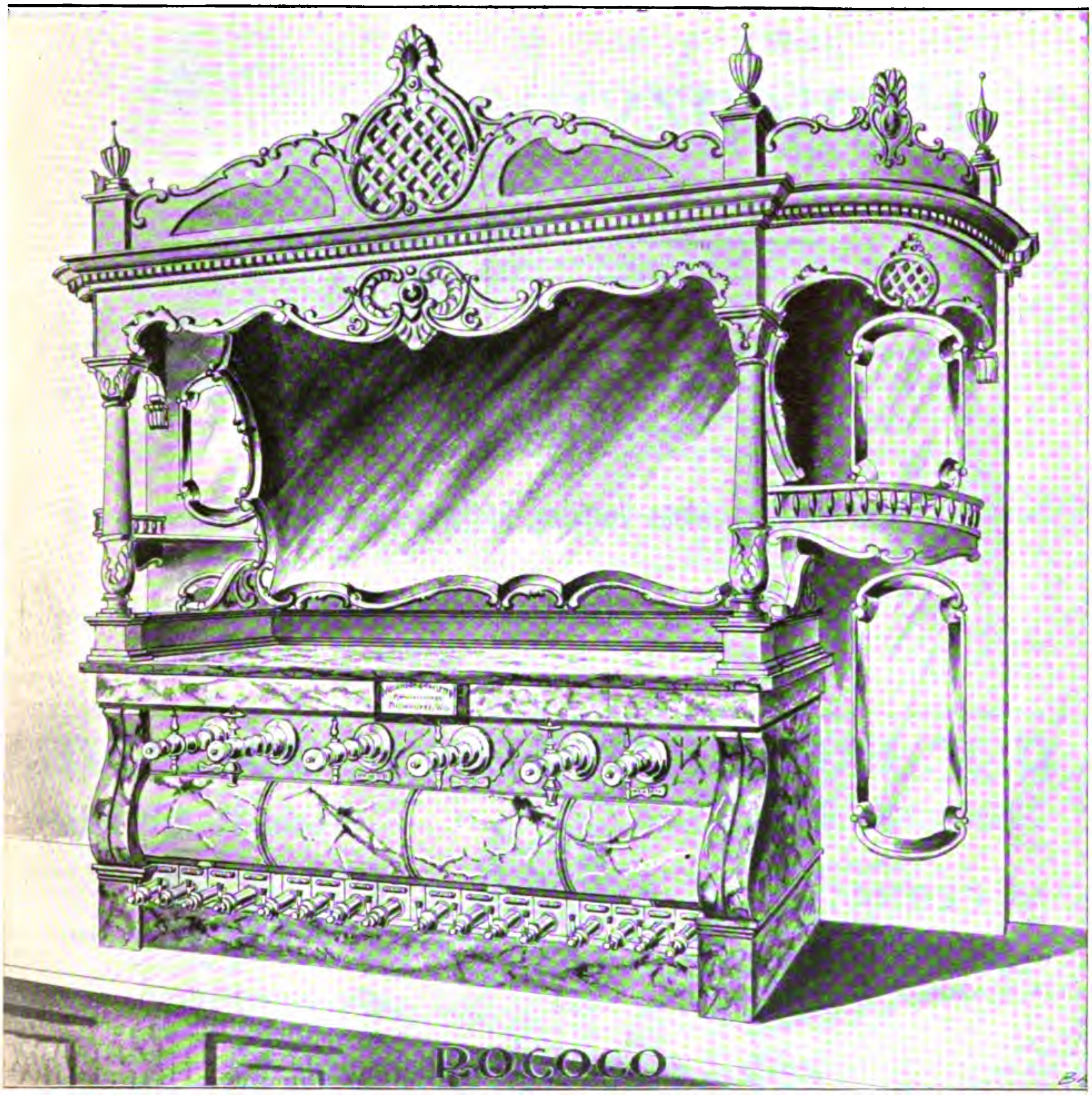

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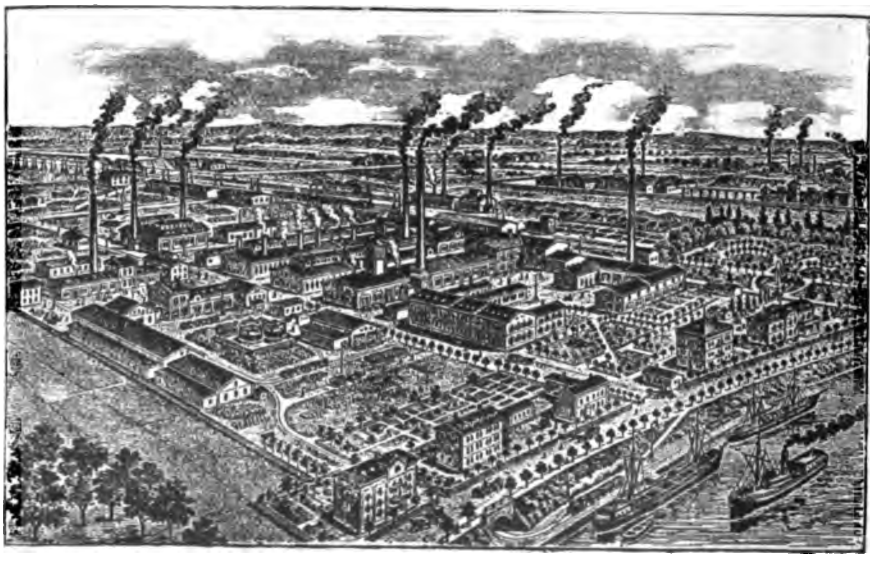

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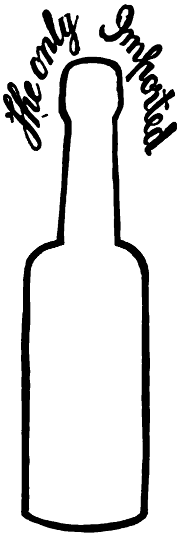

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The author is widely known as joint editor of *The National Dispensatory* and as Professor of Pharmacy in one of the foremost pharmaceutical colleges in America. He is therefore exceptionally qualified to prepare a work of the highest merit, both as a text-book for students, and as a practical reference for pharmacists in all the multifarious details of their operations. Modern in every particular, convenient in size through avoidance of obsolete and unnecessary matter, richly illustrated and issued at a reasonable price *Caspari's Pharmacy* is equally assured of immediate popularity with pharmacists and of adoption as the standard text-book for pharmaceutical students.

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SUPPLEMENT, MAY 1896.

Universities and Colleges.

Chicago College of Pharmacy.

The announcement is made that the Trustees of the State University of Illinois have accepted the Chicago College of Pharmacy as a department.

Philadelphia College of Pharmacy.

The Philadelphia College of Pharmacy celebrated its seventy-fifth anniversary by giving a supper in the College Museum on Wednesday evening, April 22.

Pittsburg College of Pharmacy.

Commencement evercises were held Friday evening, April 17, at Carnegie Library. The senior class consisted of thirty-five members.

Woman Ph. D.'s at German Universities.

The courtesy with which Americans and others are treated at German Universities is generally known. Thus it has come about that American and English women were admitted to the lecture rooms of German professors and even to examinations when German women were excluded. This has led the German women to use all their energy in order to receive for themselves the advantages of a German university education. That they are successful is again demonstrated by the fact that recently two women have taken the doctor's degree in the philosophical faculties of two universities: Miss Anna Gerber of Berlin at the University of Heidelberg, and Countess Marie von Linden at Tuebingen. The dissertation of the former was on the "Einfluss der Königin Kunigunde auf die Politik Heinrich's II"; that of the latter "Ueber die Entwicklung der Structur und der Zeichnung der Gehäuseschnecken des Meeres".

Botany at the University of Chicago.

The recent "Culver gift" of one million dollars to the University of Chicago for biological endowment has resulted in the establishment of a Department of Botany, in which Dr. John M. Coulter, for several years President of Lake Forest University, has accepted the head professorship. A large building, to be known as the "Hull Botanical Laboratory," has been planned, and its erection will soon be begun. The four stories of this building will contain ample space for lecture rooms, libraries, laboratories, and private research rooms for morphology, physiology, and taxonomy. Above the fourth story a large roof greenhouse will supply an abundance of living material under all conditions. As the building will not be completed before April of 1897, the full botanical staff will not be organized before the fall of that year.

As a result of the establishment of this department, the Botanical Gazette, the foremost botanical journal of America, edited by Professors J. M. Coulter, C. R. Barnes (University of Wisconsin) and J. C. Arthur (Purdue University) passes into the possession of the University of Chicago. The establishment of a Department of Botany, and the appointment of the senior editor as head professor, justifies the University of Chicago in assuming the financial responsibility for the publication of the Gazette, which has been brought to its present standing by private enterprise. That this has been possible demonstrates its adaptation to the needs of American botanists, as well as their cordial appreciation. Now that it is about to enter upon a period of strong financial support it expects to meet these needs in the fullest possible way, and more abundantly deserve the good will of its readers.

With this change the Gazette, however, does not become the organ of the Department of Botany of the University of Chicago or of any other university. The only change that will become apparent to its readers will come from the much larger opportunity of serving botany, for the same editors will remain in charge, and the general purpose of the journal will continue to be the same. Its relation to the University of Chicago is to bring it that permanence and possibility of development which the present condition of botanical science demands.

University of Vienna.

During the past semester 7012 students, regular and irregular, were enrolled at the University of Vienna. Of the 4643 regular students 2211 belonged to the law, 1727 to the medical, 528 to the philosophical and 177 to the theological faculty. Of the 2369 irregular students 1463 belonged to the medical faculty (of these 196 were Americans and 124 Russians), 557 belonged to the law, 340 to the philosophical faculty (incl. 70 pharmaceutical students), and 9 were theologians. The percentage of pharmaceutical students to the total enrollment, therefore, is slightly less than one percent.

University of Wisconsin.

The School of Pharmacy of the University of Wisconsin has recently received a number of valuable contributions to its collections and laboratories. Messrs. Gilpin, Langdon & Co., of Baltimore, donated an extensive collection of drugs, which constitute an important addition to the pharmacognostical cabinet. A collection of ninety specimens, many old and unusual ones, was contributed by Dr. Fr. Hoffmann, who, several years ago, donated a handsome collection of cinchona barks of historical interest to this cabinet. An interesting contribution has been received from Mr. E. B. Heimstreet, secretary of the State Board, consisting of a string of French issue peas; upon examination, they proved to be immature orange fruits turned into small spheres. Two beautiful specimens of kino were received from Baron Ferd. v. Mueller, Melbourne, Australia. Messrs. Fritzsche Bros., of New York, who have repeatedly demonstrated their liberality to the Wisconsin School, have supplied the pharmaceutical chemical laboratory with specimens of volatile oil for research work. The laboratory for practical pharmacy has just received a set of apparatus for the preparation of medicinal wafers from Messrs. Utard & Co., New York. A large number of pamphlets and journals have been added to the department library during the past few months. Steps are now being taken to have a considerable number of volumes bound.

Scientific Societies.

American Pharmaceutical Association.

President J. M. Good has announced the following members of the Special Auxiliary Committee on Membership. Each member has charge of the work of obtaining applications in his own state. If you desire to join the association apply to your state representative on the committee.

ALABAMA—E. P. Galt, Selma.
ARIZONA—Clemens L. Eschman, Phœnix.
ARKANSAS—W. W. Kerr, Russellville.
CALIFORNIA—W. M. Searby, San Francisco.
CANADA, Province Ontario—John Lowden, Toronto.
CANADA, Province Quebec—G. Lachance, Montreal.
COLORADO—Chas. S. Kline, Denver, Nineteenth and Welton streets.
CONNECTICUT—Chas. A. Rapelye, Hartford.
DELAWARE—John M. Harvey, Wilmington.
DISTRICT OF COLUMBIA—Saml. L. Hilton, Washington.
FLORIDA—Wm. A. Dell, Jacksonville.
GEORGIA—Henry R. Slack, La Grange.
IDAHO—A. O. Ingalls, Murray, Shoshone Company.
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INDIANA—F. H. Carter, Indianapolis.
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KANSAS—Mrs. M. O. Miner, Hiawatha.
KENTUCKY—Addison Dimmitt, Louisville.
LOUISIANA—L. F. Chalin, New Orleans.
MAINE—Edw. A. Hay, Portland.
MARYLAND—D. M. R. Culbreth, Baltimore.
MASSACHUSETTS—F. M. Harris, Worcester.
MICHIGAN—A. S. Parker, Detroit.
MINNESOTA—Fred. J. Wulling, Minneapolis.
MISSISSIPPI—J. C. Means, Natchez.
MISSOURI—Ambrose Mueller, St. Louis.
NEBRASKA—A. V. Pease, Fairbury.
NEVADA—W. A. Perkins, Virginia City.
NEW HAMPSHIRE—A. C. Preston, Portsmouth.
NEW JERSEY—Geo. W. Parisen, Perth Amboy.
NEW MEXICO—Jas. O. Kinnear, Deming.
NEW YORK—C. A. Mayo, New York.
NORTH CAROLINA—E. V. Zoeller, Tarboro.
NORTH DAKOTA—H. L. Haussamen, Grafton.
NOVA SCOTIA, NEW BRUNSWICK and PRINCE EDWARD'S ISLAND—F. C. Simson, Halifax.
OHIO—Louis C. Hopp, Cleveland, 198 Euclid avenue.
OKLAHOMA TERRITORY—John E. Sombart, El Reno.
OREGON—Geo. C. Blakely, The Dalles.
PENNSYLVANIA—Wm. McIntyre, 2429 Frankfort ave., Philadelphia.
RHODE ISLAND—Wm. O. Blanding, Providence.
SOUTH CAROLINA—Oscar E. Thomas, Columbia.
SOUTH DAKOTA—I. H. Keith, Lake Preston.
TENNESSEE—J. O. Burge, Nashville, Broad and Market streets.
TEXAS—Thomas R. Keene, Dallas.
UTAH—Frank A. Druehl, Salt Lake City, Main & Third South street.
VERMONT—H. A. Chapin, Brattleboro.
VIRGINIA—John F. Christian, Roanoke.
WASHINGTON—Henry E. Holmes, Seattle.
WEST VIRGINIA—E. L. Boggs, Charleston.
WISCONSIN—John R. Drake, Milwaukee.
WYOMING—Dr. Thomas G. Magee, Rawlins.

The Council Committee consists of Dr. H. M. Whelpley (chairman), St. Louis, Missouri; Chas. M. Ford, Denver, Colorado; Geo. W. Voss, Cleveland, Ohio; S. P. Walton, Atlanta, Georgia; Jacob Burgheim, Houston, Texas; and Geo. W. Kennedy (secretary), Pottsville, Pennsylvania.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Georgia	May 5	Atlanta	H. H. Arrington, Summerville.
Delaware	May 7	Dover	F. W. Fenn, Wilmington.
Alabama	May 12	Ophelika	P. C. Candidus, Mobile.
Arkansas	May 12	Little Rock	J. F. Dowdy, Little Rock.
California	May 12	San Francisco	G. J. Harvey, San Francisco.
Florida	May 12	Jacksonville	W. M. Stewart, Palatka.
Louisiana	May 12	New Orleans	J. A. Legendre, New Orleans.
Texas	May 19	Dallas	R. H. Walker, Gonzales.
Indian Territory	May 20	Wagoner	S. S. Moore, Vinita.
South Carolina	May 21	Charleston	J. A. Barbot, Charleston.
Kansas	May 26	Fort Scott	Mrs. M. O. Miner, Hiawatha.
New Jersey	May 27	Lakewood	W. C. Alpers, Bayonne.

Minnesota State Pharmaceutical Association.

The twelfth annual meeting of the Minnesota State Pharmaceutical Association will be held at the Lake Park Hotel, Lake Minnetonka, June 16, 17 and 18. Prof. A. B. Prescott, Dean of the Michigan University, School of Pharmacy, will be present and deliver an address.

German Chemical Society.

Inasmuch as Prof. F. Beilstein does not contemplate a further revision of his well-known *Handbuch der organischen Chemie*, the German Chemical Society has determined to edit and publish further editions of this valuable reference work.

The society, furthermore, contemplates the printing of original articles only in its proceedings and to purchase the Chemisches Centralblatt for the purpose of publishing chemical abstracts more completely than before. Such a concentration of energy will certainly be greeted with pleasure everywhere in chemical circles, especially since a considerable reduction in price of the Centralblatt may be expected.

Medical Meetings at Atlanta.

Besides the American Medical Association several other medical organizations will hold their annual meetings at Atlanta early this month.

The Association of American Medical Colleges will meet May 4, under the presidency of Dr. Wm. Osler of Baltimore.

Among the papers of pharmaceutical interest to be read at the meeting of the American Academy of Medicine those on "The confusion of pharmacy relating to the theory and practice of medicine" by Dr. Elmer Lee of Chicago," and on "The preparatory mental discipline for medical students" by Dr. F. H. Gemite of Portland, Me., may be mentioned.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Alabama	Ophelika	May 14	B. P. Galt, Selma.
Arkansas	Little Rock	May 12	W. W. Kerr, Russellville.
Florida	Jacksonville	May 11	Th. Clarke, Jacksonville.
Georgia	Atlanta	May 4	Dr. H. R. Slack, La Grange.
Kansas	Fort Scott	May 28	W. C Johnston, Manhattan.
Massachusetts	Baton	May 5	F. H. Butler, Lowell.
Nebraska	Omaha	May 13	G. J. Evans, Hastings.
North Carolina	Raleigh	May 5	W. Simpson, Raleigh.
Ohio	Columbus	May 12	W. R. Ogier, Columbus.
Rhode Island	Providence	May 4	W. B. Cates, Providence.
West Virginia	Wheeling	May 6	H. F. Pfost, Jackson

Georgia State Board.

Of the sixteen applicants examined March 24th at Atlanta, Ga., four received the certificate of pharmacists, four as apothecaries, one was licensed as druggist, and eight failed.

Pharmacists: —

W. H. Butler, Montezuma, Ga., J. N. King, Rochelle Ga., J. R. Jackson, Social Circle, Ga., and W. O. Bray, Adairsville, Ga.

Apothecaries: —

J. H. Meek, Black Hawk, Miss., H. H. Sternbridge, Milledgeville, Ga., E. B. Jeiks, Quitman, Ga., and H. A. Dunwoody, Atlanta, Ga.

Druggist: — F. L. Lewis, Camilla, Ga.

Wisconsin State Board.

The April meeting of the Wisconsin State Board of Pharmacy was held at Wausau. Of the fortyseven candidates thirteen were granted licentiate certificates, sixteen assistant certificates, and eighteen failed.

Licentiates: —

G. E. Reinhart, Reesville; Emma M. Suets, Marinette; J. J. Ucke, Milwaukee; Dr. C. M. Skinner, Gladys C. Arey, Hartland; C. A. Barnett, Neenah; Charlotte Falk, Bayfield; M. J. McCoy, Waukesha; Gunther Bugge, Rice Lake; C. W. Jackson, Sheboygan Falls; C. A. Hoeschler, La Crosse; F. A. Loetz, Appleton; W. F. Lardner, Oconomowoc.

Assistants: —

F. E. Palmer, Sparta; E. C. Dettoff, Bloomer; F. W. Woelz, Green Bay; D. M. Lamreux, Seymour; O. Johnson, Eau Claire; P. E. Kabel, Plymouth; F. A. Mueller, Manitowoc; E. J. Hughes, Cambria; A. F. Dukerschein, Reesville; O. R. Briggs, Colby; M. Plank, Hancock; W. E. Porter, New London; A. F. Schroeder, Neenah; Fred J. Alter, Centralia; T. A. Clark, Manitowoc; H. A. Simond, Manitowoc.

Thursday afternoon the old board adjourned after extending a vote of thanks to the retiring member and president, Henry C. Schranck of Milwaukee. Thursday evening the new board met and David A. Taylor of Stevens Point presented his papers of appointment to succeed Henry C. Schranck. The following officers were elected for the ensuing year:

President C. R. Bechmann, Fountain City; secretary and treasurer, E. B. Heimstreet, Janesville. Meeting for examinations were fixed as follows: Wednesday, June 24, Madison; Friday, Aug. 14, Stevens Point; Wednesday Oct. 21, Ashland; Wednesday, Dec. 9, Milwaukee; Wednesday, Feb. 17, Milwaukee; Wednesday, April 12, La Crosse.

History and Biography.

Three Biographies.

Number twenty of the Berichte d. deutsch. chem. Gesellsch. for 1895 contains well-written biographical sketches with portraits of three chemists: Moritz Traube, Lothar Meyer and Hoppe-Seyler. Lothar Meyer[*] was professor of chemistry at the University of Tuebingen and Felix Hoppe-Seyler[†] professor of physiological chemistry at the University of Strassburg; Moritz Traube was a wine merchant, who was not only a successful business man but a fruitful experimentor and an authority on subjects of physiological chemistry.

Thomas Dover and John Keats.

In papers read before the Historical Club of the Johns Hopkins Hospital, Dr. William Osler presents interesting facts concerning two men whose names are well-known — Thomas Dover, whose fame has been perpetuated by the powder that he originated, and John Keats, the poet.

Dover was born in Warwickshire, England, about 1660, and received the degree of Bachelor of Medicine at Cambridge. In 1708 he was part owner and third in command of a privateering expedition against the Spaniards in the South Seas. This expedition was notable for its great financial success and for the discovery of Alexander Selkirk, the original of Robinson Crusoe.

After returning to England, Dover practiced in various places, and wrote a book, The Ancient Physicians Legacy, "designed for use in all private families," which is said to have produced a sensation in London. In this appears the recipe for the original Dover's powder, as follows: — "Take Opium one ounce, Salt-Petre and Tartar vitriolated each four ounces, Ipocacuana one ounce. Put the Salt-Petre and Tartar into a red hot mortar, stirring them with a spoon until they have done flaming. Then powder them very fine; after that slice in your opium, grind them to a powder, and then mix the other powders with these. Dose, from forty to sixty or seventy grains in a glass of white wine Posset going to bed; covering up warm and drinking a quart or three pints of the Posset. Drink while sweating." In reply to rivals who claimed that his dose was dangerously large he says: "I can produce undeniable proofs where a patient of mine has taken no less a quantity than one hundred grains, and yet has appeared abroad the next day." His specific in most cases was quicksilver, and he prescribed an ounce or an ounce and a quarter of crude mercury a day. He is said to have given one patient in five days within two ounces of two pounds of mercury.

The paper gives interesting glimpses of the state of English medicine and pharmacy early in the last century. Among the questionable means employed to work up a practice was "the insertion of cures by way of news in the daily papers." As the result of a regular business arrangement the apothecary recommended a physician, who was bound to return the favor by prescribing large quantities of medicine, whether it was needed or not. This practice is heartily condemned in Dover's book.

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[*] Pharm. Rundsch., 13, p. 119.

[†] Ibidem, p. 221.

Not all apothecaries may know that John Keats, the hundreth anniversary of whose birth was celebrated not long ago, was connected with their calling. When fifteen years of age he was apprenticed to a Mr. Hammond, surgeon, of Edmonton. Afterward he "walked" the hospitals of Guy's and St. Thomas, and in 1816 he passed the Apothecary's Hall. His tastes were not with this work, and he did not excel in it. In 1817 he abandoned the profession.

[Bul. J. H. Hospital, 8, pp. 1 and 11.]

Personals.

Mr. George S. Davis, publisher of the Index Medicus, which to some extent includes pharmaceutical topics, has been elected a foreign member of the Hygienic Society of Paris, in recognition of his services to medical literature.

Prof. Dunstan has resigned his position as Professor of Chemistry and Director of the Pharmaceutical Society in order to accept the appointment as Director of the Department of Scientific and Technical Research of the Imperial Institute.

Prof. Robert W. Bunsen, whose name is familiar even to the novice in the natural sciences, has celebrated his 85th birthday March 31st at Heidelberg, at which University he has been stationed since 1852.

The April number of the Bericht of Schimmel & Co. announces that Dr. F. B. Power, for four years director of the Garfield, N. J., laboratories, has resigned on account of private reasons. During this period Dr. Power has contributed largely to the chemical literature of volatile oils, not only exposing frauds but also adding valuable positive information. This number of the Review contains a very interesting article from his pen, presumably the last one that he will issue from the Garfield laboratory. The Bericht says of his leaving: "Seinem Wirken in unserem Hause wird ein dankbares Gedächtniss bewahrt bleiben." Whatever Dr. Power may do in the future we feel confident that his contributions to pharmaceutical literature will be equally valuable and welcome.

Bibliography.

The fourth edition of Prof. Lloyd's Etidorhpa has just appeared with The Robert Clarke Company of Cincinnati.

The new Graduate Handbook is announced by Leach, Shewell & Sanborn of Boston.

A collection of plant geographic monographs is announced by Wm. Engelmann of Leipzig. The first number, Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel, by M. Willkomm has just appeared.

The Prospectus of Just's Botanischer Jahresbericht brings to notice an unusually useful publication for those working in pure and in applied botany. It aims to summarize the botanical literature of the periodicals, presenting the substance of researches otherwise unavailable to a great majority of workers. Some idea of its scope may be obtained from the subjects treated. Anatomy, physiology, cryptogams, the morphology, biology and systemtics of the phanerogams including teratology and the relations between plants and animals, paleontology, plant geography, pharmaceutical and technical botany and plant diseases form the general features of the work.

In the last, the twentieth volume, 5,300 treatises were considered. Bacteriological and pharmaceutical works are discussed, but only in so far as they are of interest to botanists not specialists in these departments. It appears that this periodical should contribute much of value to pharmaceutical botany and should in turn receive such support from workers in this line as may be possible. One way for authors to contribute to its needs and thus enhance its usefulness would be to send to the editor, Dr. E. Koehne, Friedenau, Berlin, Kirchstr. 5, reprints of such of their publications as are likely to be of interest to botanists. Of the above mentioned number of articles summarized, only 300 were forwarded to the editor and since the *Bericht* is not provided with funds to purchase such articles, the work of the collaborators is greatly increased and time is lost.

The *Bericht* is a work to which the students in every school of pharmacy should have access.

Commercial.

Parke, Davis & Co. send out with their new catalogue the announcement of a further extension of their business organization. Branch houses have been established in New Orleans and in Baltimore.

Experiments recently made with the Antitoxins of Diphtheria, Tetanus, and Septicaemia in the laboratory of the Pasteur Institute have given the following results:

Diphtheria: — The injection to guinea pigs of a quantity of this antitoxin (Gibier's) in the proportion of 1:150,000 of their weight has enabled them to survive an injection of two drops of the virulent culture of diphtheria bacillus administered 24 hours later. One drop of this culture inoculated to the control animals caused death in 24 hours.

If the above figures are valued in immunizing units, according to the formula of Spronck, each ccm. of this diphtheria antitoxin (Gibier's) contains 300 units. The horses from which the serum is taken have received during the last twenty months over 5000 ccm. of diphtheria toxin, each horse receiveing an average of two injections weekly.

Tetanus: — The injection of guinea pigs of a quantity of this antitoxin in a proportion of 1:1,000,000 of their weight enabled them to survive a fatal dose of tetanus toxin. The same dose given to the control animals caused death within 48 hours.

Septicaemia: — (*Erysipelas streptococcus.*) The injection of this antitoxin to rabbits in a proportion of 1:10,000 of their weight has enabled them to resist a dose of streptococcus culture fatal to control animals.

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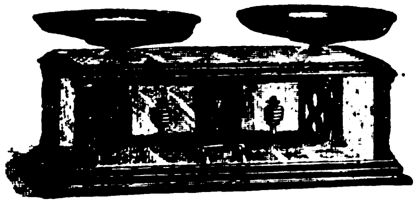

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis. as second class matter.

Vol. 14, No. 6. **JUNE. 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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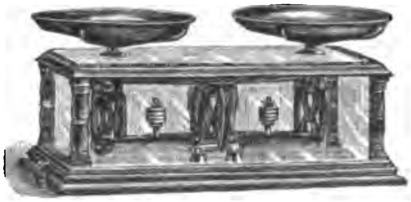

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The court reaffirmed the position of Judge Swan in his decision that the name "Syrup of Figs" was both descriptive and deceptive, and therefore, could not be employed as a trade mark.

The principles involved in this case are of vital importance to the profession of pharmacy and the drug trade of the United States. Had it been decided against us, then any nostrum maker could have monopolized any part of the English language for his individual use; until the name of every drug in the materia medica had been trade marked and thus gobbled up by the nostrum makers. By asserting our rights and fighting this case at an enormous expense to us, we have established a precedent which will prevent the trade from being imposed upon in similar cases in the future as it has been in the past. We have also demonstrated that the entire patent medicine business itself is virtually a fraud upon the public, and has no standing in the courts unless it can prove that its claims made in advertisements are true to the fact.

The full opinion as rendered by Judge Swan of the U. S. Circuit Court which was confirmed by Judge Taft of the U. S. Appellate Court will be mailed on application to all those interested.

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EDITORIAL.

The Work of the Ohio Food and Drug Commission and its Lesson.

Readers of the Review may have been surprised at the silence of this journal with regard to a matter that has not only greatly interested the general as well as the pharmaceutical public, but that affected the druggists of Ohio in a most unpleasant and sensational manner. The very fact that it was a sensation was in itself sufficient justification for refraining comment. Besides, with two hostile factions accusing each other bitterly in the daily press, it was not an easy matter to get at the exact facts from a distance.

The opposition first charged the commission with barbarous methods and suggested incompetency of some of its employees. Later, fraud was intimated and then bribery was openly charged against the commission. The charges of dishonesty were too grave to be treated lightly. It is easy to say that So-and-so has been charged with bribery and then denounce him. By such premature denunciation great harm may be done.

It is comparable to lynch law. Even the most formidable of the opponents among pharmaceutical journals now admits that its accusations were too general, since the legislative committee has shown that the commissioner himself was not directly guilty. It is generally best to let the law take its due course, slow as it may be. The heated debate pro and con over the sensation of the past year has not improved matters much, but has rather made men blind to any other views than their own. Those who oppose food and drug inspection on general principles have become almost irradicably deep-rooted in their position and bitterly denounce all legislation toward this end. The public had its eyes opened to the dangers that lurk in impure foods and particularly in defective and adulterated drugs in such a sensational and irrational manner that it can scarcely be called an education. It was to them a newspaper sensation principally for the benefit of political factions.

Now that the bomb has exploded and the inevitable damage has been done it may be well for us to calmly reflect and to emphasize the lessons to be learned.

1.) Food and drug inspection, like the tariff, should never be tolerated in the hands of tinkering politicians. Germany has demonstrated to the world how pharmacies can be inspected by pharmacists and what educational qualification should be justly demanded of inspectors and public analysts. But American pharmacists would not learn. The druggists of Ohio assembled in official session at Sandusky last year disgraced themselves by not challenging the statement of one of their number that they were not able to examine their drugs, chemicals, and preparations, that they could not be responsible for what they dispensed: in other words, that they were not fitted to be pharmacists. Let us hope that the better element of Ohio pharmacists will deny such incompetency and announce that they can and are willing to assume responsibility under just laws and a reasonable enforcement of such laws.

In various cities the better elements of pharmacists have during the past year tried to correct the liquor evil that threatens to make dram shops of the drug stores. In almost all instances the large body of druggists have raised a hue and cry against such reformation. The result as a rule has been that the police took hold of the matter and made the culprit wince. The same is true of the offences against poison registry. When will druggists learn to correct these evil themselves?

2.) Our status of pharmaceutical education is too low even for reasonable demands made by reasonable legislation. Only a small percentage of the druggists in the United States have been through a college course in pharmacy, and only a small percentage of pharmaceutical graduates are capable of testing the articles they buy and dispense. Even these, on account of excessive competition, are compelled to devote their time so largely to purely commercial matters that they could not examine their goods even if they were inclined to do so.

Colleges have not held high enough the standard of education. They have often become veritable drug-mills. State boards could not be expected to maintain higher standards than those by which they had been measured.

Here lies the fundamental error in the present situation. It is lack of suitable education all around. The public has created laws ofttimes fostered by office-seeking and office-giving politicians.

The druggists have not been educated up to the requirements of the newly created laws. Men are placed in office for political belief or pull, not because they have been educated for such positions. A clash is the inevitable result. It is really surprising that we have not had more of them under existing circumstances.

Let us not display our temper and denounce all pharmaceutical legislation because occasionally it has been unpleasant or even disastrous. New laws in most instances should be enforced not according to their letter, but according to their spirit.

Druggists, on the other hand, because they have been ill treated, should not blame the law, but having secured a proper and liberal interpretation of the law, should as readily as possible educate themselves up to it. *E. K.*

The Craze for New Remedies.

The application of diphtheria serum for immunization has been followed by an exceedingly sad result, which has attracted world-wide attention. A servant in the house of Dr. Langerhans of Berlin is taken sick with the dreaded disease and is removed to a hospital. In order to protect the children immunization is suggested. The father himself makes the injection and in a few minutes the otherwise healthy child is dead. The case is the most pathetic imaginable. Whereas, even the enemies of serum therapy will sympathize with the despondent physician and father, who in the attempt to save his child lost it, yet the tragedy may teach us a lesson.

Attention is being called to the fact that this case is by no means an isolated one. Prof. Liebreich, editor of the Therapeutische Monatshefte, has called attention to the fact that in a number of instances the application of the serum was followed by prolonged disease. The best known case is that of Dr. Pistor and his seven-year-old daughter. The child was troubled with an inflamation of the throat, which, as was shown later, was not at all diphtheritic. A single injection of serum was followed by grave symptoms and the child was seriously ill for several months. Dr. Variot, who has had considerable experience with diphtheria serum and who is a disciple of serum therapy, warns against the use of the serum for immunization purposes, because the dangers connected therewith are too great. Not only have patients frequently become diseased, but in several instances healthy children died a few days after the injection.

If one considers that from the beginning men like Liebreich, Hausemann, Schleich and others have raised their warning voices one may be surprised that many still proclaim the absence of all danger in the use of serum, and that the large mass of physicians is so ready to use it. On the other hand we have ceased to be surprised long ago. There is possibly not a day in the year in which not one or more new remedies are discovered. The Farbenfabriken find it profitable not only to supply the fashions in color, but also in medicine. Young M. D.'s are as eager to gain renown in the therapeutic examination and advocacy of a new remedy, as a fashion belle is to display something striking in color or style of dress. This mania has become wellnigh universal. Even in conservative Germany this attitude has assumed such dangerous proportions that the government found itself compelled to expell several instructors from the University of Berlin for unprofessional behavior in the way of advertising an hygienic article.

The mania for new remedies has become so great that year-books on the subject are a necessity. These remedies are not the result of long-felt wants in our materia medica, but they are the result of capital seeking employment and of intense business competition in the chemical and pharmaceutical industries. This applies not only to serums and chemicals, but to vegetable drugs and galenical preparations as well. The result has been that neither physicians nor pharmacists really know their materia medica, and that people at large, who have read all about the new discoveries and their virtues in the daily press, are practicing self-medication to such an extent as to alarm even the physician. The pharmacist no longer makes his own preparations, but draws his supplies from the manufacturer. Does he stop to consider that only a small percentage of his galenical preparations can be examined, that even the Pharmacopœia does not inform him how to examine them? No, because excessive business competition does not give him time or means to examine if he would. The physician is in an equally bad plight. Many of the younger members of the fraternity have so accustomed themselves to the use of tablet triturates, pills, elixirs and other ready formulas from the manufacturer, that tney could not write a rational prescription if they would. Truly a testimony of poverty. As it is, the physician had better not blame the pharmacist, nor the pharmacist the physician. Both should sweep before their own doors. If one were inclined to be pessimistic, the time certainly is opportune.

The writer, however, does not want to be misunderstood. There is need for new remedies, and there is still greater need for the careful scientific examination of new remedies. If the periodic law—and by the periodic law is meant not the pigeonholing of the elements, but the fundamental law that the properties of the elements are functions of their atomic weights — if this law be true, the physiological properties of the chemical compounds must be functions of the constitution of their molecules. By constitution is meant not only elemental but also structural composition. Studies in this direction have already been bearing excellent fruit. Pharmacological synthesis must become as simple as organic synthesis before the best results can be expected. This, however, is not the work of medical tyros.

Neither does the writer wish to denounce serum therapy. The future historian of the nineteenth century may consider the bacteriological remedies of our generation (crude as they are at present) as among the greatest discoveries of the age. No person will deny the great service of chloroform, because now and then a patient has died on the operating table under the influence of this great alleviator of pain.

It is not the new remedy, which the writer attacks, it is the craze for something new which he denounces. No person will be cruel enough to accuse the distracted father in Berlin of having killed his child. All will feel the greatest sympathy for him. But this lesson should ultimately be learned by the physician, the chemical and pharmaceutical manufacturer, and by the public at large that new remedies are not playthings. The denunciation of alcoholism and the opium habit are to be commended, but while combatting old evils we should not become blind to the new. *E. K.*

ORIGINAL CONTRIBUTIONS.

The Periodides of the Alkaloids, as Molecular Forms for Volumetric or Gravimetric Estimation.

By Dr. *Albert B. Prescott.*

PREFATORY.

It is manifest that a clear understanding of molecular forms is the groundwork of quantitative analysis, inorganic or organic. When the molecular constitution of the compound that is produced in any quantitative operation is well known, then the way is open for an intelligible study of the conditions of the operation, and for an exact measure of the physical constants of the product of the operation. Studies of the structure of complex acids, such as the compounds of molybdenum oxides with phosphorus and arsenic, have pointed the way for control of quantitative operations such as are made in analyses of metals.

In estimating alkaloids, in many cases there is no other method than to separate the free base as nearly pure, and with as little waste, as possible, and take the weight as it is. Whether by precipitation from water solution, or by washing out with immiscible solvents, this direct determination is quite practicable for such sharply defined bodies as the alkaloids, with their clearly drawn limits of solubility. But the same strong chemical individuality goes still more to strengthen methods of estimating the alkaloids as compounds. So sharply cut are their reactions, it is reasonable to expect the best of quantitative methods based on their reactions of combination.

Alkaloids combine by addition. The compounds most used, hitherto, in the estimation of the alkaloids, may be enumerated about as follows, taking those first which have been used earliest in the progress of analysis:

1. The Platinum Chlorides of the Alkaloids. (Their Gold Chlorides.)
2. Their Mercury Iodides. (Bismuth Iodides, etc.)
3. Phosphomolybdates. (Other conjugated phosphates.) (Picrates.)
4. Their common salts, as concerned in their volumetric reactions with acid and with fixed alkali, using selected indicators for free alkaloid.
5. Their Periodides. (Other perhalides.)

In a brief reference to each of these classes of combination we can only briefly note their character in molecular constitution and their value, or promise of value, in analytical work.

The platinum chlorides, which are apt to crystallize well, have been favorite forms for the determination of the combining number, indicative of the molecular weight, as well as merely for close separation from non-alkaloidal matter. The melting point of the platinum chloride is a standard constant. In constitution these double halides were studied by Jörgensen ten years ago.*

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* J. prakt. Chem., 141, p. 489.

The mercuric iodides of the alkaloids had their history told, with the biography of Ferdinand F. Mayer, by Prof. Schaer of Strassburg and by Dr. Frederick Hoffmann, in the German series of this Journal in 1894.[1]

I should like to enlarge upon the historical relations of the note I gave Dr. Hoffmann at that time[2], but it would be a digression from the present subject. The slender investigation I have made of alkaloid iodomercurates[3], I would gladly continue for their scientific promise, but without expectation of analytical benefit. Although Mayer's reagent has been introduced into the last revisions of the Pharmacopœias of Germany and the United States, it is not the volumetric reagent most likely to be finally adopted for alkaloids.

The estimation of alkaloids by volumetric methods of alkali-measure, that is by alkalimetry, has been gaining ground steadily for the last ten years, and is receiving contributions of permanent value from the Committee upon Indicators in the American Pharmaceutical Association. As exact and comparative studies of indicators, these contributions will be helpful in a wide range of chemical operations. But they are more than simply studies of indicators, they are studies of the response of alkaloids to indicators and studies of the limits of analytical error, general and personal, in alkaloidal estimations. All the indicators save one act by reaction of the free alkaloid, in distinction from the salt of the alkaloid. This one indicator, phenolphthalein, not affected at all by free alkaloid, can be used to record the presence of free metallic alkali, when this appears, after neutralizing the mineral acid of alkaloidal salts. So then, if we can first know that we have a strictly neutral salt of an alkaloid, we can indirectly estimate the alkaloid of the salt by an acidimetry of its combined acid.

As a volunteer worker with the Committee on Indicators, my contribution to their work was made at the last meeting of the A. Ph. A., and is given in separate text in their report[4], although my results are tabulated along with those of the four other workers. For my results I was indebted to the very discriminative labor of Mr. Scotten and Mr. De Jonge, who worked together, with double safeguard against the avoidable errors of observation. The analytical error of this method is still too large. This is manifest in comparing the figures of one analyst with those of another analyst, or those of the same analyst by one indicator with those by another indicator of about equal availability, or even in comparing successive titrations of the same analyst with the same indicator. It may reasonably be hoped that conditions may be found which will greatly diminish the analytical error. It can hardly be expected that the method will be ever made sharp enough for satisfactory adoption in the Pharmacopœia. There is at any rate this much in its favor, its results do not appear with misleading sharpness like those often obtained from Mayer's solution, or not unless inorganic alkali be present as an impurity in the alkaloid under estimation. It is to be remembered that, in alkalimetry of alkaloids, inorganic alkali represents five to ten times its weight of alkaloid, and gives a sharper reaction.

The periodides are more than alkaloid addition compounds, they are halogen addition compounds as well. I have presented a critical history of progress in the study of both inorganic and organic periodides[5], which has been published in the last volume of this journal.[6] Taking pyridine as the primary type of periodides, it was desired, both as a study in the pure chemistry of pyridine derivatives, and as likely to give a basis for analytical work, to search the synthetic possibilities of pyridine in combination with iodine. This work has been well carried out by Mr. Trowbridge who has it still going on in this laboratory, in consultation with myself. These periodides are clear cut, in crystalline form, and not too instable for close accord of successive iodine estimations. The superiodides of the pyridine-alkyl iodide, such as $C_5H_5N\begin{smallmatrix}\diagup CH_3\\ \diagdown I\end{smallmatrix}$, are, however, much more stable than the superiodides of pyridine di-iodide, $C_5H_5N\begin{smallmatrix}\diagup I\\ \diagdown I\end{smallmatrix}$, if the latter be assumed as the base of its periodide, $C_5H_5NI_4$. Pyridine previously combined with an alkyl iodide, presenting a quaternary base, holds iodine much more firmly than pyridine not so combined, presenting only a tertiary base.

Now, in an analogous way, Dr. Gomberg finds, as given later on, that caffeine with a mineral acid, as HCl, forms a delightfully stable periodide, giving sharp volumetric estimations, although caffeine in neutral solution does not combine with iodine, or not directly nor readily. It is this necessity of the presence of an acid, for the formation of caffeine periodides, that has caused their precipitation to be overlooked hitherto, because caffeine, being freely soluble in water with neutral reaction and not having salts soluble in water without dissociation, is known and treated as a free base. And the very instructive discovery of Dr. Gomberg, that iodine and a mineral acid will precipitate caffeine perfectly, has its starting point in the discovery of the effect of the mineral acid, when caffeine and iodine are present.

PERIODIDES OF PYRIDINE.[7]

I. Pyridine Alkyl Periodides.

$$\text{Type, } C_5H_5N\begin{smallmatrix}\diagup C_nH_{2n+1}\\ \diagdown I\,.\,I_n\end{smallmatrix}$$

1. *Pyridine Methyl Pentiodide.*—This was obtained in the manner given in detail below, very satisfactorily in preparation I., and with slight impurity in two other preparations, II. and III., by different ways, through separation from other periodides.

Preparation I. is in greenish-black long needles of very dark green luster, some of the crystals being nearly two inches in length. The melting-point is 47.5° C.[8]

Preparation II. is of small quantity, in greenish-black crystals, very hard and compact, melting at 47° C.

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[1] Phar. Rundschau, 12, pp. 125, 142.

[2] Loc. cit., p. 146.

[3] Am. Chem. J., 2, p. 294; 14, p. 606.

[4] Proc. Am. Pharm. Assoc., 43, p. 187.

[5] Am. Assoc. Adv. Sci., August, 1895; J. Am. Chem. Soc., 17, p. 775.

[6] Pharm. Rundschau, 13, p. 233.

[7] A paper by A. B. Prescott and P. F. Trowbridge, read at the Springfield Meeting of the American Association for the Advancement of Science, August, 1895.

[8] Measurements of the crystals, and various optical determinations, as well as work by other physical methods, especially such as bear on molecular weight and constitution, are reserved together for a continued investigation of these bodies.

Preparation III. is in crystals exactly like I., melting at 47° C., by recrystallization in alcohol from a greenish-black crystalline powder, the latter being stable and melting at 43° C. The analysis of III. was obtained only from this powder, before the final crystallization. These three preparations are, alike, so far stable that after keeping eight months in glass-stoppered bottles, most of the time in the dark, the glass is but just perceptibly stained with iodine liberated from decomposition.

The analyses of the methyl pentiodide, by methods detailed further on, gave results as follows:

	Calculated for $C_5H_5N.CH_3I\ I_4$.	Found. I.	II.	III.
Iodine total	87.06	86.74	......	86.69
Iodine by titration	69.65	68.87	69.83	69.55

2. *Pyridine Methyl Diiodide.*—Obtained through different ways, as stated later, in two preparations. I. is in reddish-brown crystals, thick plates, compact in clusters. Some crystals are an inch long and a fourth of an inch wide. Melting-point, 91.5° C. The crystals are very stable. On eight months' standing there are no perceptible results of decomposition. II. is in red interlaced fine needles of good length, the last previous crystallization having been in dark-red sheaf-form clusters of great beauty. Melting-point, 91.0° C. In stability II. is equal to I.

The analyses, with duplicates as specified later, gave the following:

	Calculated for $C_5H_5N.CH_3I.I$.	Found. I.	II.
Iodine total	72.91	72.88	72.33
Iodine by titration	36.55	36.97	36.40

3. *Pyridine Methyl Triiodide.* — Obtained in three preparations, each from a separate recrystallization out of a common mother-liquor, that of II. of the methyl diiodide. Again it is obtained in the first crystallization by another method, that for IV. I. is in dark-red fine needles, quite perfect in outline and partly clustered in certain sheaves characteristic of the earlier crystallizations of this triiodide. Melting-point, 50° C. Perfectly stable.

II. shows dark-red needles, the previous crystallization having been merely a loose crystalline mass. Obtained perfectly stable, with melting-point of 50° C.

III. is dark-red needle clusters of a certain exact sheaf-form appearing illusively in several earlier crystallizations. But a small quantity was obtained, with a melting-point of 49°—50° C.

IV., perhaps the most perfect, is in very dark red or reddish-black plates with needles, perfectly stable, and melting at 48° C.

The results in analysis have been these:

	Calculated for $C_5H_5N.CH_3I.I_2$.	Found. I.	II.	III.	IV.
Iodine total	80.14	79.32	79.22	......	78.70
Iodine by titration..	53.43	53.08	51.52	52.75	53.15

4. A product was obtained of seeming distinct character, in composition and melting-point nearly approaching the pentiodide, but with the elemental figures of a tetrapentaiodide, that is dipyridinedimethylenneaiodide. It is reserved for further work. It is in greenish-black, lustrous, long needles, well defined, of a melting-point of 44° C. The total iodine in three successive determinations was found to be, respectively, 85.83, 85.88, and 85.83 percent; calculation for $(C_5H_5N.CH_3I)_2I_7$ giving 85.68 percent, and for $C_5H_5N.CH_3I.I_4$, 87.06 percent. The iodine by titration was found to be 67.52, 67.08, 67.02, and 66.69; calculation giving for these formulas, respectively, 66.45 and 69.65 percent.

5. *Pyridine Methyl Octaiodide.* — This product is named provisionally, one fairly satisfactory preparation of it being obtained, a second preparation having the requisite composition but (possibly from its more compact crystallization) having a higher melting-point, and a third preparation, while agreeing in melting-point with the first, falling too low in percentages of iodine. The preparation, detailed below, was instituted in the hope of obtaining the enneaiodide. I., by recrystallization from alcohol below 0° C., is greenish-black, in both plates and needles, melts at about 26° C., and is fairly stable when kept at about 15° C. or below. II. is in crystals of the same color as those of I., but more slowly formed and more compact, consisting of flat needles, some of them an inch long, with melting-point of about 41° C. III. was imperfectly crystallized, rather solidified in a crystalline mass, of the color of I., and melting at 25° C. We do not include III. among the determinate preparations. It gave of total iodine, 90.36 percent, and of iodine by titration 78.41 percent, both figures being low for the octaiodide and much too high for the heptaiodide.

	Calculated for $C_5H_5N.CH_3I.I_7$.	Found. I.	II.
Total iodine	91.51	90.79	90.99
Iodine by titration	80.07	79.82	80.13

6. *Pyridine Ethyl Triiodide.* — Obtained, as specified under the account of preparations, from liquid secondary products corresponding to those which gave the three samples of the pyridine methyl triiodide, in lustrous greenish-black needles, well defined, stable through exposure to the air, and melting at 49° C. In the analysis, two determinations by silver iodide gave for iodine 78.389 and 78.388. Three titrations with the thiosulphate gave for iodine 52.784, 52.612 and 52.616. Inasmuch as the mother-liquids have been found to contain higher periodides, it is evident that these crystals are not wholly freed from mother-liquid.

	Calculated for $C_5H_5N.C_2H_5I.I_2$.	Found.
Iodine total	77.85	78.39
Iodine by titration	51.90	52.67

7. Higher ethyl periodides of pyridine, in nearly black crystals melting below 10° C., were indicated from treatment of the primary oil-like product, though not yet obtained in purity, as stated under the preparation of the triiodide.

Methods of Preparation. — The methyl periodides of pyridine are best obtained, first, by adding the methyl normal iodide of pyridine to dissolved iodine. We have also obtained several pyridine methyl periodides, second, by adding pyridine to a solution of methyl iodide and iodine. We have found, however, as stated further on, that in the latter way there is formed some proportion of a pyridine periodide destitute of methyl, though the avidity of pyridine for methyl iodide ensures a considerable proportion of methyl periodides. For pyridine ethyl periodides the second way would not promise formative results at all, owing to the tardy addition of ethyl iodide to pyridine. The normal pyridine alkyl iodides used were prepared for the purpose, and had the properties specified in another paper by one of us (P), in which, also, is a statement of the constants of the pyridine used in these preparations. In adding the pyridine alkyl normal iodide to iodine, the latter was taken in the proportion to make the particular periodide desired, but other periodides would appear as subordinate products. As to just how much effect the relative quantity of iodine added exerts upon the extent of iodine combination, further investigation is now in progress.

The preparation of pyridine methyl pentiodide was done as follows: Eighteen grams of pyridine methyl iodide dissolved in a little alcohol were added to fifty grams of iodine previously dissolved in 200 cc. of alcohol, the solutions being taken at low temperature. A dark green oil-like liquid, thick and cohesive, at once separated in abundance at the bottom. The thin alcoholic liquid above was decanted off and the oil set aside at a temperature several degrees below 0° C., when it shortly solidified in crystals, not melting at 25° C. These were dissolved in warm alcohol, and the solution set aside at about —5° C., when crystals of preparation I. appeared. They were dried over sulphuric acid to a constant weight, for analysis and determination of the melting-point. This periodide was undoubtedly obtained in its amorphous oil-like state by O. Lange in 1885[9] while engaged in obtaining decomposition products of pyridine methyl iodide by Ladenburg's process. He reported obtaining the heavy dark-green oil, which would not solidify on standing for a day, and which he apparently did not analyse.[10] III. of the methyl pentiodide was obtained by treating a part of the first crystalline form of the methyl octaiodide before described, with ether, which dissolves a small portion of the crystals, leaving the remainder as this preparation III. of the pentiodide. Preparation II. of the methyl pentiodide was obtained from the mother-liquor of the methyl octaiodide by evaporation and redissolving the crystals in alcohol.

The preparations of the pyridine methyl diiodide in I. and II. were from solutions quite different from each other from the beginning, but in both cases they were from later crops of crystals following the addition of free pyridine to solution of the other two materials. The final crystals of I. were washed in a very little cold alcohol, and then dried over sulphuric acid for ten days. The crystals of II. were obtained fine by rapid formation in alcohol surrounded by a freezing mixture.

The preparations of pyridine methyl triiodide in I., II. and III. were crystallized from the mother-liquids of II. of the corresponding diiodide. II. of the triiodide was itself recrystallized several times. I. and III. were in more compact crystals of slower formation. But IV. was the result of a different method throughout, following the addition of iodine solution to the methyl normal iodide, using proportions intended for the diiodide. The final crystals were by a single recrystallization of the first crop. It was dried between filter papers over sulphuric acid.

The preparations of pyridine methyl octaiodide (provisionally so termed) were instituted by adding eleven grams of the normal iodide dissolved in a little alcohol, to fifty-five grams of iodine in as little alcohol as possible, both solutions being hot. The greenish-black oil-like mass separated at once. The decanted solution was cooled, and other portions of the oil obtained. Below 0° C. the oil crystallized well. I. was crystallized from solution in alcohol at low temperature. II. was crystallized from alcohol by spontaneous evaporation out of doors in cool weather. The final crystals of each were dried between filter papers, and kept in the vault at about 12° C.

Pyridine ethyl triiodide was obtained following the addition of alcoholic solution of the normal iodide to alcoholic solution of iodine. The first product, chiefly higher iodides, appeared in an oil-like precipitate, and this, after decanting the alcoholic liquid, was dissolved in hot alcohol, and the solution kept for six hours at —4° C. without obtaining crystallization. Afterward crystals were obtained but without success in drying them. Moist with the oil they gave figures a little too low for the tetraiodide. Repeating the entire operation, but not decanting the oil, the entire mixture was exposed to low temperature as before, and the oil solidified in a mass of fine crystals better than before, but these melted below 10° C., and the attempt to obtain a pure high periodide had to be deferred. That the oil, which is stable when dried and has no odor of iodine, contains high iodine additive combination was shown by its analysis, giving figures midway between hexiodide and heptiodide. Now the alcoholic liquid decanted from the oil in the first operation, on cooling below 0° C., gave an excellent crop of crystals. These, dried for several days over sulphuric acid, at about 21° C., constitute the preparation described under the name pyridine ethyl triiodide.

II. Periodides of the Amine and of the Tertiary Ammonium Base.

Type,

$$C_5H_5N\begin{cases} I.I_n \\ I.I_n \end{cases}$$

1. *Pyridine Tetraiodide*, $C_5H_5N.I_4$.—Adding to pyridine an alcoholic solution of iodine until the precipitate ceased to form, thereby leaving a slight excess of iodine, there was obtained a bulky crystalline precipitate of a green color, not of a red color as reported by Dafert.[11] This precipitate was filtered out, drained, washed with alcohol, and drained dry, all under the filter pump, then dried between filters over sulphuric acid for several days. It was found soluble in alcohol, ether, chloroform, and less readily in benzene. It was recrystallized from benzene in I., from chloroform in II., and from alcohol in III. In each result the crystals were dark lustrous green. Those of III. were in button-like aggregations of fine needles, the whole about half an inch in diameter. From each solution the crystals showed the same melting-point, 85° C. The alcoholic mother-liquor on evaporation gave a crop of very small dark-green crystals, IV., of the same melting-point. All these crystals gave off perceptible traces of iodine on standing in a glass-stoppered bottle, being very perceptibly less stable than the crystal preparations of the various pyridine *quaternary* base periodides already de-

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[9] On Picolines, Ber. d. Chem. Ges., 18. p. 3436.

[10] It was in following Lange that this preparation I. of the methyl pentiodide was first undertaken, and the "oil" obtained. After fruitless attempts to crystallize it from various solvents, it was abandoned for six weeks, when, on one very cold day, in moving things it was set in the window next the glass, and presently it became a mass of crystals. These did not melt when returned to the warmer air of the laboratory. A new preparation was at once commenced as above.

[11] 1883, Monatsh. Chem., 4, p. 509.

scribed. This instability may be the cause of the slight deficiency of iodine found in analysis, the resulting figures being as follows:

	Calculated for	Found.			
	$C_5H_5N.I_4$.	I.	II.	III.	IV.
Iodine total by silver iodide,	86.49	85.72	85.94	85.63	85.48
Iodine by titration with thiosulphate,		85.05	84.79	85.73	85.63

This periodide, therefore, contains no iodine firmly bound as in all normal iodides, none that is not promptly taken up by thiosulphate. In this constitutional feature it is a periodide sharply unlike all the pyridine alkyl periodides known, and unlike the pyridine hydrogen pentiodide found by Dafert,[12] and further described below as examined by us. A superbromide of pyridine was obtained, in 1882, by Grimaux,[13] who writes for it the formula, $(C_5H_5NBr_2)HBr$. He found it not very stable; in analysis he made but one estimation of bromine, that by silver bromide; and he found the compound reduced by hydrogen sulphide to pyridine hydrobromide and hydrobromic acid. The triethylphosphine tetraiodide, $P(C_2H_5)_3I_4$, inferred by Masson and Kirkland in 1889,[14] is of the same type as our pyridine tetraiodide. Treated with hydrogen sulphide half its iodine entered into phosphonium normal iodide, and half into hydriodic acid.

Several months before the preparation of pyridine tetraiodide as above given, a product was obtained in another way which puzzled us at the time, but which we now recognize as this last-formed pyridine tetraiodide. It was obtained in the first crystalline precipitate after adding free pyridine to the solution of methyl iodide and iodine, in the second way for making the methyl periodides. The mother-liquor of the precipitate gave us the methyl diiodide, preparation I. of that product. The precipitate itself crystallized from a chloroform solution, gave very dark green short needles, melting at 84.5° C., and soluble in ether and in benzene. The total iodine was found as 86.32 percent (the average of four results, lowest 86.22, highest 86.50). At that time a satisfactory titration for iodine was not obtained on account of the solvent, but without any solvent one slow titration resulted in 85.82 percent, indicating the absence of normal iodine, when the preparation was put aside for later inquiry. It appears, therefore, that when free pyridine is added to methyl iodide and iodine, in alcoholic solution of each, some periodide of pyridine without methyl is formed in the first precipitate, notwithstanding the extreme avidity with which pyridine unites directly with methyl iodide.

2. *The Pyridine Hydrogen Pentiodide of Dafert.*[15] — This was obtained, following the plan given by that author, in crystals such as described by him, melting at about 85° C. (Dafert 89° C.) In analysis it gave 88.03 percent of total iodine, and 70.20 percent of iodine by titration (calculation for $C_5H_5N.HI.I_4$, total iodine 88.77 percent, and superiodine 71.02 percent.) For the titration the periodide was dissolved in alcohol, the end reaction was sharp, and the result conclusive as to the fundamental difference between the two compounds, one of which we believe to be a periodide of C_5H_5NH, and the other of C_5H_5N.

A hydrogen periodide of pyridine, therefore, like alkyl ammonium periodides in general, includes for each atom of nitrogen (in the molecule whatever its magnitude) just one atom of iodine which is left united to the nitrogen after the action of reducing agents of sufficient strength. On the contrary the periodides of pyridine not having ammonium hydrogen or alkyl contain no iodine left by such reducing agents in union with the base, as we say, no iodine firmly bound. Various forms of these two types may be represented as follows:

(1) $R_4NI.I_n$, quaternary alkyl ammonium periodides.
$(R'''N)RI.I_n$, quaternary pyridine periodides.
$(R'''N)HI.I_n$, pyridine hydrogen periodide.
(2) $(R'''N).I_n$, pyridine (amine) periodide.
$(R''N)Br_2HBr$, a superhalide (Grimaux).
$R_3PI_n.I_n$, inferred by Masson and Kirkland.

III. Estimation of the Iodine of Periodides.

1. The total iodine is obtained by precipitation as silver iodide, weighing this on filters to be described later.

The sample is weighed, from a weighing bottle, by difference, into a No. 2 beaker. About twenty cc. of a saturated solution of sulphurous acid is added, then a slight excess of silver nitrate solution (used of known strength). The mixture is heated on the water-bath for about an hour, breaking the crystals of periodide if necessary with a flat end of a glass rod, then acidulated strongly, using twenty or thirty cc. of nitric acid, (sp. gr. 1.20), and heated one to two hours or until the precipitate is of a uniform light straw color and the liquid perfectly clear. The precipitate is then put upon the prepared funnel of ascertained weight and washed, first with five percent nitric acid and then with hot water, using the pump throughout. The funnels are small sized "carbon tubes," the bottom loosely fitted with a glass plug or shoulder, on which is a layer of cracked glass, twelve to twenty mm. thick, made from beakers and sieved to pass a ten-mesh but not a twenty-mesh. After this is washed level, under pressure of the filter-pump, a layer of acid-washed asbestos is floated over it, and the whole dried at 130° to 150° C. for about two hours or for constant weight. Weighing is done with duplicate funnels, suspending them with an aluminum loop.

The washed silver iodide in the funnel is dried, with its duplicate (also wetted), for two hours at 130° to 150° C., or until weight is constant. A set of about thirty of the funnels have been in hand, and when all have been used, the asbestos layer and precipitate are carefully removed, and a fresh asbestos layer floated on, all which can be done for the set in about two hours.

Two to four parallel estimations have been made, and the average taken. The agreement of the estimations is fairly shown in these figures, quoted from the results: 86.69, 86.79, 86.84, 86.66; 72.45, 72.08, 72.45; 86.65, 86.29.

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[12] F. W. Dafert, 1883, Monatsh. Chem., 4, p. 508. Dafert says, p. 509: "In alkoholischer und in wässeriger Lösung des Pyridins erzeugt Iod in Alkohol, respective in Iodjodkaliumlösung, ebenfalls unter gewissen Umständen eine Fällung. Eben so bei Anwendung von Schwefelkohlenstoff. Das dabei erhaltene Präparat ist roth gefärbt und jedenfalls mit dem obigen Superiodid *nicht* identisch. Eine weitere Untersuchung wird wohl Näheres ergeben." We have not been able to find a further publication by Dafert upon this compound.

[13] E. Grimaux, Compt. rend., 95, p. 87; Bull. Soc. Chim., 38, p. 127.

[14] J. Chem. Soc., 55, p. 139.

[15] 1883: Monatsh. Chem., 4, p. 508.

2. The iodine in excess of that for a normal iodide, that is, the iodine responding to reducing agents, has been estimated volumetrically by thiosulphate, using a solution of which one cc. equals 0.010 of iodine. To make this solution, "C. P. sodium thiosulphate" is recrystallized small by stirring while the solution cools. The volumetric solution is standardized by standard solution of potassium dichromate, which in turn is checked with one standardized with "chemically pure" iron wire. The dichromate is purified by fusing a chemically pure article and pouring upon a tile. The factor of the thiosulphate solution is taken every two or three days. The periodide analyzed is weighed by difference, from a weighing bottle into a No. 3 beaker, taking 0.150 to 0.600 gram. Of alcohol from ten to fifteen cc. are added. All the periodides so far obtained are soluble in cold alcohol, but with much difference in the readiness and abundance of this solubility, and this property governs the speed of the estimation. The crystals can be broken under a flat end of a rod, and if not readily soluble, the titration is commenced before solution is completed, keeping down the excess of the iodine-like color. At the end starch can be used as an indicator, but after practice this is not necessary, as the extinction of the iodine-like color can be read to within one drop of the thiosulphate. The burettes had been calibrated and were used with a table of corrections. Other solvents have been tried but alcohol proves far the best for the crystals in titration. Two to four titrations have been made and the average given in each estimation. The agreement of the titrations is represented by a few quotations; of the pyridine methyl diiodide, 37.01, 37.24, 36.48, 37.17; pyridine methyl triiodide, 78.55, 78.84.

DIPYRIDINE NORMAL IODIDES.

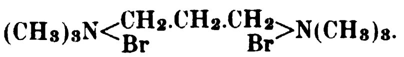
Along with the study of pyridine superiodides has been carried a study of the normal double iodides of pyridine. Mr. R. F. Flintermann, working with the writer, in the course of considerable work upon the reactions of pyridine with dihalogen substituted hydrocarbons, obtained dipyridine trimethylene dibromide, with determination of its molecular weight and its constants, in comparison with those of its homologues, and with corresponding compounds of the alkylamines.[16] A comparison of these bodies may be made as follow:

From trimethylamine:

The ethane derivative,[17]

$$\mathrm{(CH_3)_3N}<\begin{array}{l}\mathrm{CH_2.CH_2Br.}\\\mathrm{Br}\end{array}$$

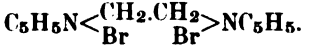
The propane derivative,[18]



$$\mathrm{(CH_3)_3N}<\begin{array}{l}\mathrm{CH_2.CH_2.CH_2}\\\mathrm{Br\qquad\qquad\ \ Br}\end{array}>\mathrm{N(CH_3)_3.}$$

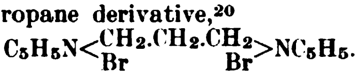
With pyridine:

The ethane derivative,[19]



$$\mathrm{C_5H_5N}<\begin{array}{l}\mathrm{CH_2.CH_2}\\\mathrm{Br\qquad Br}\end{array}>\mathrm{NC_5H_5.}$$

The propane derivative,[20]



$$\mathrm{C_5H_5N}<\begin{array}{l}\mathrm{CH_2.CH_2.CH_2}\\\mathrm{Br\qquad\qquad\ \ Br}\end{array}>\mathrm{NC_5H_5.}$$

The reaction of pyridine with other di-halogen substituted hydrocarbons is being studied in this laboratory by Mr. S. H. Baer and myself, with interesting results nearly ready for publication.

PYRIDINE ALKYL NORMAL IODIDES.

The study of pyridine superiodides made demand for the preparation of new pyridine normal iodides, and a fuller examination of such as had been reported. This work enabled us to bring out certain interesting relations between the physical constants of the homologues of this class, as follows:[21]

Quaternary Base Iodides.

	Melting points.	Boiling points of the free alkyl iodides.
With homologous alkyls:		
Pyridine methyl iodide.....	117°[22]	45°
Pyridine ethyl iodide.......	90.5°[22]	72°
Pyridine propyl iodide....	52-53°[23]	102°
(Pyridine butyl iodide decomposes before melting[24]........................		130°)
a-Picoline methyl iodide	226.5-227°[25]	45°
a-Picoline ethyl iodide...... under............................	100°[26]	72°
With isomeric alkyls:		
Pyridine isopropyl iodide	114-115°[23]	89°
Pyridine propyl iodide....	52-53°[23]	102°

Quaternary Base Metallic Chlorides.

(Pyridine tertiary butyl salts are not formed)[24]		100°
Pyridine isobutyl platinum chloride................	220°[24]	119°
Pyridine isobutyl gold chloride........................	139°[24]	
Pyridine secondary butyl platinum chloride.........	191°[24]	119°
Pyridine secondary butyl gold chloride................	129°[27]	
Pyridine normal butyl platinum chloride.........	205°[24]	130°
Pyridine normal butyl gold chloride................	111°[27]	
With homologous tertiary bases:		The free tertiary bases.
Pyridine methyl iodide...	117°[22]	160°
Picoline methyl iodide	226.5-227°[25]	132-140°

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[16] The full report of this work was read at the Springfield Meeting of the American Association for Advancement of Science, last August, and has been published, under names of R. F. Flintermann and A. B. Prescott in Journal American Chemical Society, 18, p. 28, (Jan. 1896.)

[17] A. W. Hoffmann, 1858: Proc. Roy. Soc., 9, p. 293. "Addition of nitrate of silver precipitates only one-half of the bromine as bromide of silver, while even by protracted ebullition the second half remained untouched."

[18] G. Kleine, 1894: Chem. Centrbl., 1, p. 16, from Zeitschr. Naturwissenschaften, 66, p. 1. Kleine found a smaller proportion of the mon-ammonium product.

[19] Davidson in the London Laboratory of A. W. Hofmann, 1681: Proc. Roy. Soc., 11, p. 261; J. Chem. Soc., 14, p. 161.

[20] R. F. Plintermann, loc cit.

[21] From a paper read at the Springfield Meeting of the American Association for the Advancement of Science, August, 1895, and published in full in Jour. Am. Chem. Soc., 18, p. 91.

[22] Trowbridge, this Laboratory.

[23] Baer, this Laboratory.

[24] Lippert: Ann. Chem. (Liebig), 276, p. 182.

[25] Ramsay: Phil. Mag. (5), 4, p. 241. Before the constitution of picoline was established. It is not necessary here to distinguish between isomeric picolines.

[26] Anderson: Ann. Chem. (Liebig), 94, p. 361.

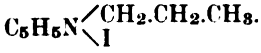
Comparing two isomeric addition compounds:		Ter. base.	Alk. iod.
Pyridine ethyl iodide, $C_5H_5N.C_2H_5I = C_7H_{10}NI$...	90.5°[22]	116°	72°
Picoline methyl iodide, $CH_3.C_5H_4N.CH_3I = C_7H_{10}NI$..........................	227°[25]	132°	45°

The iodides of these quaternary bases give constants more distinctive of composition than do the platinum chlorides, at least so far as melting points of the iodides are available. In tabulating the melting points of the pyridine alkyl iodides it appears that, comparing homologues and again comparing isomers, the melting points of the addition products fall as the boiling points of the free alkyl iodides rise.[27] The same reverse ratio appears among picoline alkyl iodides. On the contrary, comparing pyridine methyl iodide with picoline methyl iodide, the two tertiary bases being homologous and the alkyl iodide being the constant factor, it is found that the melting point of the addition compound rises as the boiling point of the tertiary base rises, and in an extreme proportion.

THE PYRIDINE ALKYL HYDROXIDES.

As further bearing upon the character of pyridine derived bases, the hydroxides were further studied by Mr. S. H. Baer, who also prepared some not previously reported. It may be well to give here the properties of two of these quaternary hydroxides, as free bases:

Pyridine Propyl Hydroxide.[28]



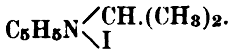
$$C_5H_5N\begin{cases}CH_2.CH_2.CH_3.\\ I\end{cases}$$

Pyridine propyl iodide, prepared in this laboratory, was treated with moist recent silver oxide, shaking for some time in a flask, keeping down the temperature. The silver oxide for all this work was made by precipitating silver nitrate with potassium hydroxide and washing the precipitate until the washings give no color reaction with hematoxylin, to ensure the removal of the alkali. Silver oxide is sufficiently soluble in water for its solution to color litmus or phenolphthalein.

On filtering out the silver iodide, the solution of pyridine propyl hydroxide was colorless, and was found to precipitate salts of lead, silver, copper, iron, aluminum, chromium, cobalt, and nickel, an excess of the hydroxide dissolving only the precipitates of lead and of aluminum, these reactions agreeing with those of fixed alkalies.[29] In parallel treatment with pyridine it was found not to precipitate these salts, the only apparent reaction with any of them being a blue color with the copper salt. The solution of pyridine propyl hydroxide gave the alkaline reaction with the following indicators: litmus, phenolphthalein, brazil wood, cochineal, hematoxylin, and methyl orange. Pyridine gives an alkaline reaction with all these indicators except phenolphthalein and hematoxylin, these two being capable of use in a volumetric acid estimation of the pyridine propyl hydroxide in presence of pyridine.

On heating the solution of the pyridine propyl hydroxide it acquires a red color, and the solid residue by evaporation has a black color, dissolving in water again as a red solution.

Pyridine Isopropyl Hydroxide.[30]



$$C_5H_5N\begin{cases}CH.(CH_3)_2.\\ I\end{cases}$$

This base was prepared in the same manner as the normal propyl hydroxide, and it was found to give the same reactions with indicators and with metallic salts, as well as the same color when evaporated.

The isopropyl base has been elsewhere stated by us to form a more stable iodide, of higher melting point and lower solubilities, than the iodide of the normal propyl base, and the isopropyl hydroxide has been taken, instead of the normal propyl hydroxide, in our further experimentation.

The production of the pyridine isopropyl hydroxide, in solution, can be made quantitatively complete as a base saturating sulphuric acid. Weighed portions of the iodide were converted to hydroxide in solution, with due precautions against loss, and the liquid titrated with tenth normal solution of sulphuric acid, using hematoxylin and cochineal, respectively, as indicators, and titrating back to the end reaction with tenth normal solution of potassium hydroxide. The hematoxylin was used in a titration to avoid interference by free pyridine, should this be present as a product of decomposition, as it does not color this indicator. The cochineal was used because it is an indicator of special delicacy for titration of pyridine alkyl hydroxides.

The results were as follows: the percentage of hydroxide calculated from the iodide being 55.82, the percentage of hydroxide found by titration with cochineal was 55.25 and 55.88, with hematoxylin it was 55.6 and 55.7.

The solution of pyridine isopropyl hydroxide, on evaporation to dryness, yields a black residue, which is permanent, so that after standing three months it gives with metallic salts all the reactions of the hydroxide. The color in solution changes to red, like that of the normal propyl hydroxide. By exposure to the air it is steadily converted to the carbonate.

When the solution was treated for some time with carbon dioxide gas, then evaporated to dryness, the residue was found to bear the composition of a normal carbonate of the univalent base. This composition was determined from the amount of carbon dioxide recovered in an absorption train, in ratio to the weight of iodide taken for conversion to hydroxide. The calculated weight of carbon dioxide being 14.44 percent of $(C_5H_5N.C_3H_7)_2CO_3$, there were obtained 14.99, 14.88, and 14.79 percent of carbon dioxide. In other trials the carbonation was incomplete, reaching only to 9.3, 9.47, and 10.1 percent.

In no case was the full quantity of pyridine isopropyl hydroxide obtained in weight of the dry residue, although the evaporation was conducted under different conditions, in vacuum, in a stream of dry air, and in a stream of dry hydrogen. In the case of the carbonate, the weight of the residue did not fall below the theoretical quantity. As hydroxide the weight of the residue always fell a good deal short of the full quantity.

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[27] This reverse ratio does not hold good between ethyl and isopropyl, in their pyridine iodo-products, the one being not the direct homologue, but the isomer of the homologue of the other. In 1882 Carnelly remarked of "isomeric compounds" as shown by many instances, that their melting points follow a rule the reverse of that accepted for their boiling points, namely that "those melt the highest in which there are the greatest number of side chains." (Phil. Mag. (5), 13, p. 126.)

[28] From a paper by A. B. Prescott and S. H. Baer, in the Jour. Am. Chem. Soc. for March, 1896, Vol. 18, p. 247.

[29] In work with quaternary nitrogen hydroxides, certain metals have been found to give distinctive reactions, likely to have analytical value. I hope to be able to report upon some of these ere long. A. B. P.

[30] From the paper last cited.

Pyridine isopropyl platinum chloride, perfect in proportions, was prepared from the black residue left on evaporation of the water solution of pyridine isopropyl hydroxide, by treatment in the usual manner. The black mass was dissolved in alcohol, treated with hydrochloric acid and platinum tetrachloride, and the crystalline precipitate fitted for analysis. Fine crystals were obtained, not melting below temperatures which cause decomposition.

	Calculated for $(C_5H_5N.C_3H_7Cl)_2PtCl_4$.	Found. I.	II.	III.
Platinum............	29.95	30.08	30.48	30.29
Chlorine..............	32.58	32.50	......	32.39
Ratio of Cl to Pt...	100:108	100:108	......	100:107

Pyridine isopropyl sulphate, the normal salt, was also prepared in fine crystals, by adding sulphuric acid to the hydroxide.

In various efforts to obtain the pure hydroxide in the solid state, crystalline or amorphous, vacuum desiccation, freezing temperatures, formation in absolute alcohol solution, and other agencies were successively tried, without success. Crystals were not obtained, and the residue was always dark colored. Evaporation in a stream of dry hydrogen yielded a residue of the same weight as that obtained by evaporation in a stream of dry air.

These results, so far, may be summarized as follows:

Pyridine isopropyl hydroxide remains in aqueous solution for a time without decomposition or loss in any way. The residue by evaporation of this solution, in air, or hydrogen, or vacuum, contains a considerable portion of the unchanged hydroxide, along with certain decomposition products not yet determined. The normal carbonate of this base, its normal sulphate, and its platinum chloride are easily prepared and preserved.

(To be continued.)

Betel Chewing.

By Dr. *Rodney H. True.*

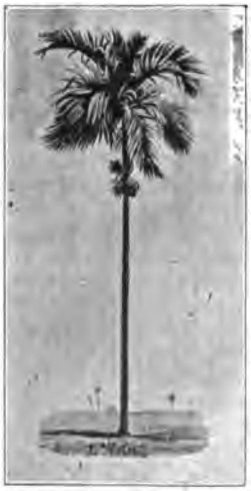

Fig. 1. Betel palm. (From Lewin's work l. c.)

Among the many means to which mankind turns for relief from the monotony and the drudgery of existence, few furnish solace to so many at so little expense to the mind and to the body as the chewing of the betel nut. If evidence were needed to show that it satisfies to a great degree some strong desire felt by a large part of the human race, the fact that betel chewing is a habit with about one-seventh of the population of the globe would be sufficiently convincing. That such a habit can have a history of over twenty centuries on one continent and that this is at present the most populous part of the earth, vouches for the absence of seriously harmful results. It enters largely into the ancient customs of the East and plays an important rôle in the lives of millions from early childhood to old age. It makes demands calling forth extensive industries and creates a considerable commerce. It gives hints to the physician and offers to science some of its most attractive fields for research.

The betel-chewing habit covers a wide geographical range. Beginning with the eastern boundary of Afghanistan on the west and the Himalaya mountains on the north, it rules all to the east and the south including the islands of the Pacific as far as Torres Straits (north of Australia) and as far east as 169° E. from Greenwich, including, therefore, a great part of the scattered groups of the Northern Pacific. Within these limits with but a few local exceptions, the natives of all races, colors and conditions, male and female, kings, princes, priests and paupers, daily and hourly, at work or at ease, standing or sitting, at home or with strangers, almost "from the cradle to the grave",—all are slaves to this habit.

Although causing no pronounced mental manifestations, exerting in general only a mild effect, this habit holds its devotees with a relentlessness almost without a parallel. The last test to which the Tagali maiden puts her lover to prove the ardor and the sincerity of his attachment is to require him to abstain from the betel. He may comply but it is only temporary since he is sure to return sooner or later to the old ways. On the island of Timor, when a chieftain dies, betel chewing is not indulged in for the seven days following. In India, after the death of a kinsman, deep sorrow is expressed by leaving this luxury untouched.

For the preparation of the betel roll as chewed, three very different articles are necessary: the nut of the betel palm, *Areca Catechu* L. (Fig. 1), the leaf of the betel pepper, *Piper betle* L., and powdered lime usually obtained from calcined mollusk shells. The pungent pepper leaf is daubed over with a little lime, a piece of the betel nut laid on it, the whole rolled up and thrust into the mouth. It is chewed until the mass is exhausted of its juices when the remainder is discarded and a new "chew" immediately prepared. It would be interesting to know what circumstances many centuries ago led some native experimenter to bring together these three so widely differing ingredients.

As before hinted, betel chewing has a long history, so long, indeed, that a host of customs and traditions have grown up about it.

One of the earliest records of betel chewing dates from 161 B. C. when, in a battle between the people of the Malabar region and those of another race, the Duttagamini, the Malabar warriors discovered on the lips of their enemies the blood-red color given by betel chewing and spread the rumor that their foes were wounded.

In the tenth century, Masûdi, the Arabian writer, describes betel chewing as a national habit in India. At later dates, numerous historians and travelers have described the habit in detail and have left us pictures which in all essentials represent the conditions now prevailing among the masses of the inhabitants of the betel-chewing world.

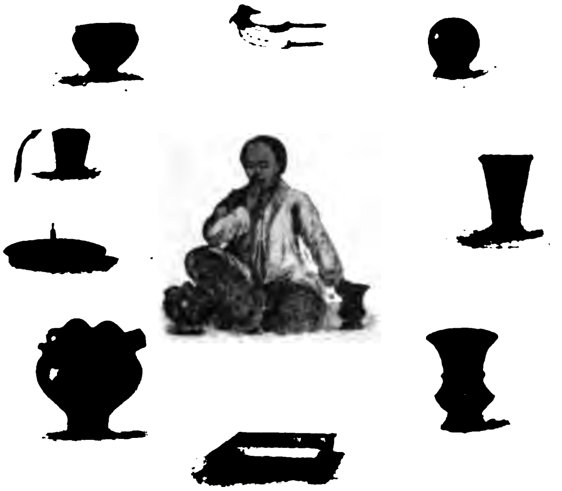

Fig. 2. Simple outfit for betel chewing. Javanese work. (From Tschirch: Indische Heil- und Nutzpflanzen. With permission of the publisher.)

As the cola nut in Africa and the kava kava root among the islanders of the Pacific, so within its realm, the betel furnishes the basis for many ceremonial usages. The betel, wherever used, is the sign of friendship, peace, courtesy and hospitality. At a mere meeting on the street or at the formal reception of ambassadors, on entering a hut or a palace, the betel is offered and gladly accepted. The failure to extend or to accept this courtesy is regarded as a great neglect or an insult. Under those conditions, friendly relations can not exist.

Marriages could hardly take place without this friendship-founding and friendship-sustaining article. In Siamese, the word for home is *kán mãk*, meaning a dish containing betel. A betel roll prepared with spices and sent by a woman to a man is regarded in parts of India as a declaration of love.

At divorce ceremonies, the betel pepper figures conspicuously. The wife arraigns the husband before the authorities, pays a fixed sum and is free after she tears a betel leaf into two parts, one of which each of the principals consumes.

In parts of New Guinea, the daughters of the chiefs, when they become twelve or thirteen years old, remain at home for two or three years, after which their return to society is celebrated with much pomp. In the dance which takes place, the debutantes pass in and out among the dancers and make known their selection of a lover by handing him a betel nut.

In many places it is regarded as improper for a person of lower rank in speaking with a superior to cease chewing his betel roll. This probably is due to the fact that the betel sweetens the breath when chewed, and to cease might expose the person of higher degree to annoyance from the other's evil breath.

Although the symbol of friendship and good will, the tender of the betel may conceal deadly designs, since poison is easily administered by this method. Perhaps for this reason, it is customary in Sumatra to accept betel nut and pepper leaf but to use lime from one's own pouch. Danger is regarded as especially apt to lurk in the delicacies offered by the women.

On the Brahmaputra River, the natives measure distance by the number of betel rolls consumed in marching it. It is, of course, a time unit rather than one of distance. A similar custom is found among the coca chewers of Peru.

In religious ceremonies, the betel plays an important part. The ingredients, especially betel nuts, are frequently found as offerings laid on the altars for the gods. In Borneo, at the burial of the dead, Hatton saw the corpse in full dress, in a sitting posture, a cigarette in the mouth and near at hand a receptacle containing all of the ingredients necessary to betel chewing.

In New Guinea, the people believe that the future life is to be spent absolutely without work and care in the possession of endless quantities of betel nuts and day and night are to pass in the enjoyments of eating, dancing and chewing the betel. A fuller account of these and of many points of interest necessarily omitted here may be found in Dr. L. Lewin's admirable monograph entitled "Ueber Areca Catechu, Chavica betle und das Betelkauen."* This paper has been freely used in the preparation of this article.

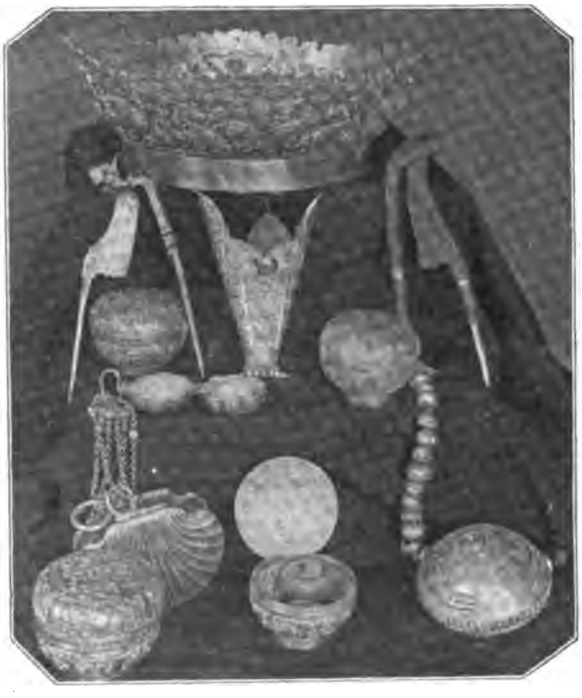

Fig. 3. Silver instruments used in betel chewing. Javanese work. (From Tschirch: Indische Heil- und Nutzpflanzen.)

Before passing on to the consideration of the action of the betel, we will notice more particularly the method of preparation of the roll and the instruments used.

Although in the essentials the method is with all races the same, many local variations are, however, found. The condition of the betel nut when consumed is not always the same. Sometimes the hard, dry, mature nut is chewed after it has been cut in pieces or powdered, again, the younger, soft nuts are chosen.

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* Ferdinand Enke, Stuttgart, 1889.

In Siam, instead of wrapping all three constituents together, a portion of the nut is put into the mouth and a piece of the pepper leaf covered with lime taken afterward. In the Philippine Islands, a somewhat more artistic method is found. The leaf after being covered with the lime is so folded as to form a flat band. The ends are then brought together forming a ring into which is fitted a round slice of the nut. A peculiar custom is found among the Malayans of Java and Borneo. The tip of the pepper leaf is always broken off and discarded before use. The reason for this procedure lies in an old legend. As a certain king almost at the point of death tossed on his couch in despair, a snake approached him bearing in its mouth a leaf of the betel pepper, tendering with the leaf the advice to try its efficacy. The king took the leaf, tore off the tip which the snake had held in its mouth and, after eating the leaf, enjoyed a quick recovery. In memory of this incident, the tip of the leaf is torn off even at the present day.

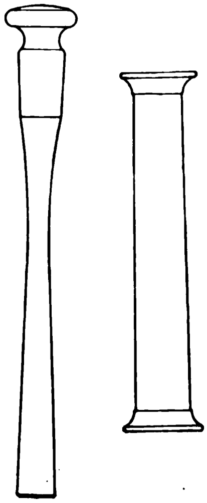
Fig. 4.

The betel nut is contained in a tough, fibrous husk from which it must be freed. To aid in this as well to reduce the dry nut to a proper state of division, instruments are necessary. For removing the husk, a somewhat sickle-shaped knife is used in India. The hard nuts are either broken by a blow from some heavy object or are split by means of some edged tool. Rude wooden mortars with pestles made from the shell of some gigantic ocean mollusk are used by natives of some regions. Since the nuts yield more readily to an edged instrument, strong knives of various patterns or heavy shears are used. The knife used in India for this purpose usually has a strong handle and a broad, bent blade.

In the pharmacognostical collection of the University of Wisconsin are a number of instruments, exhibited at the World's Fair, from Johore. Among the tools for husking the nuts are found three different forms. One has a short, broad, doubled-edged, bent blade. Others are not sharpened, being merely narrowed to a thick strong point. The third form is sharpened much after the manner of an ordinary chisel.

A brass instrument (Fig. 4) used for dividing the nut consists essentially of a cylinder having at the upper end an inside diameter of 18 mm. Gradually contracted downward until near the lower opening it is suddenly narrowed to a diameter of 13 mm. by a collar-like projection into the tube. The accompanying piece, likewise of brass but rather roughly filed into form, is chisel-like and plays into the tube as far as the sudden contraction near the lower end. Pieces of nut are dropped into the tube and chopped until the fragments fall out at the lower opening.

For cutting the nuts a kind of shears is employed in some regions. They consist of two arms, the lower of which merely supports the nut, the sharp upper blade dividing it. These shears are to be found from the simplest design to the most richly ornamented. In Fig. 2 is one of the simpler patterns; in Fig. 3 are more elaborate examples from Java, made of silver.

The betel chewer needs, of course, some sort of a receptacle for the various ingredients used. These receptacles are of the most various forms and workmanship. Some are woven from plant fibres, some are formed from gourds or cocoa-nut shells. The more permanent and ornamental receptacles are made of wood, sometimes most richly decorated with copper, silver or gold, with carving or with inlaid work of variously colored woods or mother-of-pearl. In Sumatra, the outfits of the wealthy are usually of silver, enriched with beaten work. In Java, a receptacle with compartments for the lime, betel nuts, tobacco and cardamoms is customary. These boxes are likewise ornamented in all degrees of richness. In Fig. 3 are shown some beaten silver receptacles of Javanese workmanship. In Fig. 5 is represented a compartment receptacle of a simpler sort from Johore.† It consists of two parts, the box proper, and a shallow till with places for the various ingredients. Figs. 2 and 3 shows still other forms of receptacles used by betel chewers. Special care must be taken with the lime supply. If more is desired than is demanded for immediate consumption it must be kept in airtight receptacles in order that it may not lose its caustic property, and, therewith, its efficiency. Various devices for this purpose are made use of. All variations are found from the joints of bamboo tightly stoppered, used by the common people, to the richly carved ebony and tortoise shell articles of the rich.

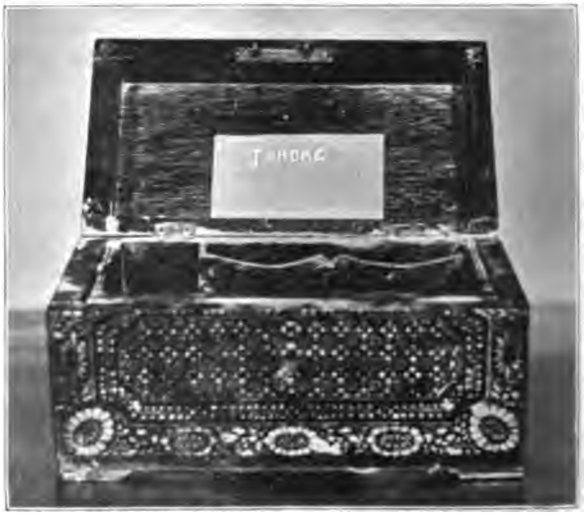

Fig. 5. Simple compartment receptacle.

Since each time a new betel roll is taken into the mouth the saliva is at first ejected, cuspidors may fairly enough be included in the list of necessities. As would be expected, this problem is easily solved by the poor. The higher classes have receptacles for this purpose made in various ornamental forms. In the royal court of Siam, a servant carries a golden spittoon about after the king. In Java, the princes have in their train two pages or young girls, one of whom carries about the copper cuspidor, the other the golden betel box.

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† This illustration is taken from a specimen in the pharmacognostical collection of the School of Pharmacy, Madison, Wis. It was exhibited at the World's Fair from Johore.

How does the betel habit affect its devotees? The effect following the first experiment with the betel as experienced by one not habituated is an unpleasant, burning sensation in the mouth and a feeling of constriction in the throat. As the chewing is repeated, however, the first disagreeable effects wear off, giving place to sensations so agreeable that even Europeans become devotees of the habit.

The quantity of saliva secreted is much increased and a blood-red color is imparted to it. In the Pharmacographia Indica, it is stated that the natives freely eject this red spittle "preferably over recently white-washed walls. The dry stains are often mistaken by the police for blood stains and pieces of plaster, leaves, and grass thus stained have frequently been forwarded to the chemical examiner for detection of blood."

The dark red color given to the gums and lips as well as the blackening of the teeth are among the most conspicuous results of betel chewing. White teeth are regarded by the Malayans as an imitation of apes and dogs while the brownish-black teeth of the betel chewer are much celebrated in Indian song. The agreeable perfume given to the breath is stated by the betel user to be one of the many reasons for his indulgence.

The physiological action depends on several factors. If one is unaccustomed to the practice or if green nuts are used, a temporary dizziness may follow. A poisonous variety of betel nut is occasionally found but this is regarded by the authors of the Pharmacographia Indica to be a form that has reverted to its former wild condition. In general, the betel is a mild, narcotic stimulant bringing about a feeling of general comfort, good humor and exhilaration. These effects, however, are not more marked than those experienced by the user of tobacco while enjoying his "Havana".

From the standpoint of toxiology, less is to be said against the betel habit than against either the tobacco or the alcohol habit. Lewin sums up the matter in these terms: "Those who take into consideration the conditions prevailing in the land of the betel chewer, come to the conclusion that, in view of the peculiar nature of the scanty nutrition of the Indians and the many climatic influences threatening the health, a moderate indulgence in betel chewing is advantageous."

The prophylactic and healthful influence of betel chewing has been recognized by the Dutch government by making provision for the distribution of the ingredients in hospitals and prisons. Whether the protection against fevers claimed by some for the betel habit is a reality or not must be here left undetermined.

Probably the greatest evil lies in the slavery to which this habit condemns its devotees and in the consequent danger of moral degeneration.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

Essential Oils, Sicilian and Calabrian.

As can be seen from the subsequent statistical notes,* the export of these essential oils has amounted to 112,549 kilos during the year 1895, representing a value of £ 226,278. — being less than in the preceding year. This decrease may be explained by the fact that during the last six months of 1895 but a comparatively very small stock of oils was at disposal. The rise of prices was undoubtedly due to this scarcity of goods.

The prospect for the new crop of agrumen fruits was not favorable last fall. The extraordinary heat and drought could not but act detrimentally to the growth of the fruit and subsequent rains came too late to be of much use; long prevailing storms during the subsequent months did the rest. In consequence of these drawbacks the prices of all kinds of agrumen fruits experienced an upward tendency, which lasted until this March, when the first news of the Abyssinian calamity arrived. The effect of these reverses was so depressing that a decline in values resulted, which extended to all products and merchandise, including essential oils. This relapse, however, can only be a temporary one, as all trade relations in the districts which produce these oils are substantially normal.

Impressed as we are with the great importance of these essential oils for our branch of chemical industry, it has been our aim for years to restore the rather demoralized trade in these products to a sound basis. We believe we are justified in stating that our efforts in this direction have been rewarded with some success. The tests elaborated by us for the examination of the principal Italian essential oils have also proved a complete success. After the first irritation caused by this sweeping innovation had passed, the reliable method of controlling the quality of oils by our test more and more meets the appreciation and unqualified approval of and the adoption by, all who are interested in the production and the commerce of this commodity. The committees of various Chambers of Commerce in the larger cities of Lower Italy and of Sicily, consulted by the Government in regard to this important question, have also added their share to enlarge the impression that the prosperity of the oil producing districts and of this branch of the commerce of Italy depend to a large extent upon the introduction and the intelligent application of our tests for the identity and purity of these essential oils. Several analytical laboratories already have been or are about to be opened in Messina and in Reggio for testing these oils by our method and for certifying to their quality, in order to offer some reliable guarantee to the purchaser.

In order to elucidate some points as yet unsettled in this matter, a study of a number of details had still to be accomplished so as to attain to positive knowledge instead of relying upon vague conjecture. This investigation has been performed throughout the present campaign from the month of November until the end of February by Mr. Karl Fritzsche, eldest son of the senior partner of our firm.

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* See Report, p. 22.

Bergamot Oil. In the course of the present campaign it became evident that the fruit gave an unusually large yield, raising the expected return of but 50 percent of a fair medium yield by about 20 percent in addition. The transactions in bergamot oil have been rather dull, in consequence the high quotations with which the last season closed could not be maintained, and have declined by about 20 percent.

An advance of prices is hardly to be expected in view of the present disturbed political situation. It must be borne in mind also that the last winter has been a comparatively dry one with insufficient rains, so that the water courses in Calabria hardly contained half as much water as in ordinary years, and that the level of the underground water throughout Southern Italy has receded by about one half of a meter and that, furthermore, the bergamot trees, in all probability, will be exposed to a still greater drought during the coming summer than has been the case in 1895. And yet this species of citrus particularly needs for vigorous growth a regular and copious irrigation of the soil.

The stock of bergamot oil still remaining is estimated at 15,000 kilos. In point of quality the yield of the present season is inferior to that of last year, and at the close of the campaign but few lots of oil contained 40 percent or more of linalyl acetate.

We quote from Mr. Karl Fritzsche's report on his personal observations in regard to the methods of production the following particulars: —

The first two samples of oil of bergamot pressed from the latest crop were received on the 16th of November from Melito on the Southern coast of Calabria. The specimen No. 1 had a normal specific gravity and optical rotation and contained 33.3 percent of ester. No. 2 was equal to No. 1, except that it contained 34.6 percent of ester. All further supplies of samples of unsophisticated oils up to November 24th showed upon examination a percentage of ester ranging between 32 and 37. A sample of a so-called Nero oil obtained from the peels of unripe fruits, fallen from the trees, contained but 25 percent of ester.

With the fruits from four basketfulls gathered with much difficulty on November 30th, the following experiments were made with a view to ascertaining whether the amount of ester contained in bergamot oil stands in direct relation to the state of ripeness of the fruits. The fruits were carefully assorted, and the oil obtained separately from the green, unripe fruits on one machine and from the yellow, half-ripe ones on another. The constants of the two oils were found to be the following: —

Oil from green fruits: Ester 31.04 percent.
Optical rotation +17° at 18° C.
Oil from half-ripe fruits: Ester 33.24 percent.
Optical rotation +17°18′ at 18° C.

The estimation of the optical rotation could be accomplished in a 100 mm. tube, since both oils had a very light yellow color with a slight greenish tint.

The samples of oil supplied subsequently and until the 3d of December showed as much as 37.7 percent of ester. Until that date only a small part of the crop of fruits had been gathered, because incessant rains had flooded the orchards to such an extent that the ground was too wet to admit of a general plucking of fruits.

The oil is expressed by machines only and this method works much more thoroughly than can be done by hand and is said to be in general use at present, securing a better yield of oil and saving much time. Handpressed oil, therefore, is scarcely to be had any more, and only in small quantities. The peel of bergamot fruits is thin and as tough as leather, while that of oranges and lemons is of a spongy consistence.

On the 18th of January the manufacture of bergamot oil was all but finished in Calabria, and in most orchards only a few days more were occupied in working up the remaining fruit. During the last weeks much rain and hail had fallen and the pressing of fruits had to be interrupted several times, because the yield of oil is much less in cooler weather. The oil obtained at a lower temperature (at the average +8° C.) is thick and turbid and can only be cleared by passing it through sponges or flannel filters. In warm and fair weather a much larger and a clearer yield is obtained.

The same conditions were met with in all the plantations visited, in Melito, Gallico, Arangea, Sbarre, Sancta Catarina, Catona etc. Only those fruits which are not globular but have the oblong shape of lemons are cut and pressed by hand, as is done with lemons, because the machines in use are adjusted to globular fruits only. From the remainder on the filters and from those defective fruits which are unfit even for being pressed by the hand, the oil is obtained by distillation. This oil, of course, is of inferior quality, yet large quantities of the same are exported to America. A specimen of this oil showed upon examination the exceedingly small amount of only 5.1 percent of ester.

Our observations made during the harvest of the fruit and the manufacture of the oil proved the gradual rise of the amount of ester to about 37 percent, which figure may hold good for the average amount contained in the oils of the present campaign. When this was finished, early in January, several samples of more lately pressed oils were found to contain as much as 40 percent and even more of linalyl acetate having at the same time a normal amount of residue upon evaporation. On visiting later on two plantations in Catona, oils from fully ripe fruits, selected and pressed in our presence, contained 44 percent of ester. The samples of oil, obtained at the commencement of the harvest season from unripe fallen fruits, contained 25 percent, from unripe, plucked fruits, 33–34 percent, from ripe fruits, 37 percent on the average, and from somewhat overripe fruits at the end of the season, as much as 44 percent of ester. This rise of the percentage of ester in proportion to the ripening of the fruits which yield the oil justifies the conclusion that the amount of ester found in oil of bergamot stands in an unmistakable relation to the degree of ripeness of the fruits and that it increases as they ripen.

Lemon Oil. According to reliable reports from Messina the trade in these fruits has been ruinous in the present season. The crop of early fruit (so-called Verdelli) has been a very small one in Sicily and has been bought up by American dealers at high prices. When the prospects for the winter crop showed a decrease of at least 30 percent as compared with the corresponding crop of last year, wild speculation set in and the fruit still green on the trees was sold in advance at excessive rates. In consequence of a long and hot summer the fruit ripened much sooner than had been expected, and immense quantities were shipped to North America, causing a rapid decline in prices, quite disastrous to Italian speculators and exporters. Since then the rates for fruits have recovered normal prices.

The rapid fluctuations of the rates in the fruit market of course reacted upon the oil prices. The producers of oil were restrained by the excessive prices and could not venture upon active work except at considerable risks. This explains the high quotations at first exacted for orders on credit, and not before the rapid decline of prices in America was there a chance for the manufacturer again to produce at fair rates. Considering the fact that the export of the new season entirely depends upon the new crop, it is not to be wondered at that considerable fluctuations of prices, ranging between M. 1.— and M. 1.50 per kilo, occurred. In consequence of the brisk demand for fresh oil, an accumulation of new stock was deferred, and not before the first part of March, and upon a slight decrease of the demand, did a somewhat larger supply take place. But this cannot but be a temporary one, since hardly more than about 25,000 kilos of oil are in stock, not enough to cover the demand for the next 7 or 8 months.

The yield of oil from fresh lemon peels is much less this year than the last, mainly in consequence of the persistent absence of rain during the four months preceding the harvest.

A close inspection of the orchards of all the lemon-producing districts of Southern Italy by our representative has enabled us to form a comprehensive estimate of the conditions prevailing and of the methods used, in this kind of cultivation. — The manufacture of lemon oil is in general carried on by three different methods:—

1. The **Spugna process;** this is the tradional operation with sponges, as described by Prof. Flückiger in his well known sketch: "Easter Vacation in the South." (Arch. d. Pharm. III, Vol. 27, p. 1065.)
2. The **Scorzetta process.** The fruits are cut into two halfs, the pulp is removed with a kind of spoon, and all parts of the peel are then pressed against a sponge by constantly turning it in the palm of the hand. This method has the advantage that the peels remain unbroken and retain their original appearance. After they have been deprived of the oil, they are salted and then exported under the name "Salato." The pulp also remains unimpaired so that it yields its full supply of lemon juice. After having passed twice through the pressers it is used for feeding cattle.
3. The **Machina process.** A number of contrivances have been tried for obtaining the essential oil of agrumi fruits by other less empirical and more economical methods. More recently a machine which has a rather complicated construction, but works very well, has come into use in Nizza di Sicilia, Mascali and Tremestieri. The product obtained by this process, however, is said to be less profitable, because both the quantity obtained and the quality of the oil leave much to be desired. It must remain to more extended experience to demonstrate, whether this machine will prove a success, or whether it will fall into oblivion like most of its predecessors.

The samples of "hand-made oils" and "machine oils" showed no constant difference in specific gravity or in optical rotation.

It may furthermore be stated that the machines specially, constructed and used in Calabria for pressing oil of bergamot, after the close of the bergamot season are occasionally also employed for pressing oil of lemon. The oil obtained in this way mostly shows, however, a greenish tint, resulting from its contact with the metal of the machine.

The present studies, extended also to a close observation of the methods for obtaining and preparing oil of lemon, were, among other aims, mainly directed towards ascertaining what influence, if any, the several localities exercised upon the optical rotation of the oil. Observations made with excellent instruments by Mr. Eduard Jacob already had adduced strong evidence that such variations between oils of lemon from various districts and localities exist. The recent personal investigation of our representative with oils pressed in his presence have fully borne out the corresponding previous observations of Mr. Jacob.

The oils derived from Barcellona on the Northern coast of Sicily and from the plains around Syracuse showed the highest optical rotation. It has been said that frequently oranges, somewhat damaged and unfit for sale, are mixed with lemons. This would raise the angle of optical rotation of oils obtained from such a mixture of fruits. In order to find out whether variations in the optical rotation of commercial lemon oils are due to natural or to such artificial causes, four specimens of oil from different plantations and freshly pressed in the presence of our representative were examined. Their optical rotation was from + 64° to 67° 30′ at 15° C.

The total result of our personal observations and the determination of optical rotation in the lemon oil producing districts was the following:

Sicily.

a) Provinces of Messina, Catania, Syracuse.

Oils from + 59° — + 61°: Messina and adjacent districts, Nizza di Sicilia.
Oils from + 61° — + 63°: Acireale, Santa Teresa di Riva, Scaletta, Sta. Lucia, Patti, S. Agata, S. Stefano.
Oils from + 63° — + 64°: Catania, Giarre, Giardini, Acireale, Lentini.
Oils from + 64° — + 67°: Barcellona, Siracusa,

b) Province of Palermo.

As regards the essential oils of this province, there are no records of observations that reach back several years. According to our notes and the statement of Dr. Theodore Leone, director of the research laboratory of the municipality of Palermo, the optical rotation of lemon oil produced in that province varies from + 59° to + 63°. Since, however, the latter figure is so high as to be rated as exceptional and has never yet been observed by us, these oils have been included on the map among those with an optical rotation from + 59° to + 61°.

[Semi-Annual Report of Schimmel & Co.]

Pharmaceutical Technique.

A New Aræometer.

This instrument consists of a glass vessel composed of two parts, A and B, separated by a glass wall C, the lower part being closed by a ground glass stopper. When B is filled with distilled water and the instrument is immersed in the same fluid, it should sink to the point marked 1.00 on the scale. To use the instrument, the lower bulb is filled with the liquid whose density we wish to determine, the stopper is inserted and the instrument immersed into distilled water, when the sp. gr. can be read off directly on the scale. One can read accurately to the third decimal place and approximate the fourth. Two classes of in-instruments are made, for liquids heavier and those lighter than water. [Jour. Phys., 4, p. 561.]

Chemistry.

Method for the Purification and Desulphuration of Mineral Oils.

In the course of his studies of the chemistry of brown coal tar, F. Heusler (Berichte, 25, p. 1665) has found that the sulphur compounds contained therein belong to the thiophene series. In order to effect, if possible, a desulphuration of this tar, thiophene was subjected to an investigation which led to the result that this compound under the influence of aluminium chloride is changed, by the partial splitting off of sulphur, to a sulphur-containing resin. As it has been found that the unsaturated compounds contained in the tar oils react quantitatively upon each other in the presence of aluminium chloride with the formation of high boiling lubricating oils and as analogous results are obtained by treating shale and petroleum oils in the same manner, we have here a method for producing illuminating oils free from unsaturated substances as well as sulphur compounds from these crude products. In this process artificial lubricating oils free from paraffin are obtained as side products; the quantity of which corresponds to the amount of unsaturated compounds contained in the mineral oil employed.

The action of the aluminium chloride upon the mineral oils takes place in such a manner that the unsaturated substances and sulphur-containing bodies react upon each other. Only when an excess of aluminium chloride is present do the reactions already known, especially that of Friedel and Craft, who first observed the splitting off of gaseous hydrocarbons from the paraffin oils, take place. A characteristic of the process under consideration is that the action of the aluminium is a fractional one; the further addition of aluminium chloride is stopped when the quantity of this compound brought into reaction is just sufficient for the desulphuration of the oil. In this there is at the same time a considerable technical advantage. For instance in the purification of mineral oils there is considerable saving of aluminium chloride, and on the other hand a secondary decomposition of the purified oil is prevented.

The quantity of aluminium chloride required is the greater the richer the mineral oil is in unsaturated substances and sulphur compounds. It varies from 0.5 to 5.0 percent.

The carrying out of the process differs in details with the different mineral oils or tar distillater. The following cases are to serve only as examples.

I. Desulphuration of Ohio Oils.

Ohio oil is fractionated so that the illuminating oil fraction contains but small quantities of substances boiling below 150°. 100 parts of this crude illuminating oil are heated to boiling in an apparatus provided with a reflex condenser and stirring apparatus, and 0.8 parts of aluminium chloride gradually added. Hydrochloric acid and a considerable quantity of sulphuretted hydrogen escape. After the evolution of gas has ceased it is allowed to cool, and the oil separated from the aluminium-containing resin that has formed. The oil is first washed with water and then with caustic soda solution and distilled after the addition of a small quantity of lime.

II. Brown Coal and Shale Tar Oils.

The fractions of brown coal or shale tar are treated with 3 to 4 percent of aluminium chloride in the manner described. After cooling, the separated oils are washed with water and then either distilled with water-vapor or the unchanged saturated hydrocarbons separated from the lubricating oils that remain in the residue by fractional distillation. The lubricating oils are either used directly or after distillation in vacuum. [G. I. P.]

A Review of some Improvements in Chemical Industry, by Frank H. Thorp.

Heavy Chemical Manufactures.

Sulphur.

Sicily continues to furnish the larger part of the world's supply of sulphur, although many of the mines are now idle. The industry has suffered a period of great depression since 1890, and the price in 1895 had fallen to about $16.00 per ton for seconds and $15.00 for thirds. A few operators have attempted to introduce more modern appliances for mining, the better to meet low prices, but in most cases this has only been done after a struggle against native prejudice, even resulting in riots at the mines.

In the methods of extracting sulphur from the gangue little advance has been made since the papers of Professors Mallet[1] and Newbury[2] were published. The "calcerone" is most generally employed, though melting out the sulphur by the use of solutions of calcium chloride[3] is used to some extent. Extraction by means of carbon disulphide has made little progress.

Japanese sulphur has become a considerable competitor with the Sicilian, and in these mines are found many modern improvements and economical working. Late statistics show that 84 mines were in operation in 1894. A new sulphur deposit of probable future importance is being developed on the island of Tanna, New Hebrides. A rich ore, with cheap labor and fuel at hand may make this even a more formidable rival of Sicily.

Our domestic production has fallen until it scarcely deserves notice, but little more than 400 tons being produced in 1894. An innovation recently introduced in the Nevada mines, is a plant for hydraulic mining to remove the overlaying surface earth. The method of extraction employed in this country is the Dubois[4] process of distillation with steam in rotary retorts. The deposits of Louisiana and Texas have not been developed.

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[1] J. W. Mallet: Am. Chem. Journal, 1, p. 273.

[2] S. B. Newbury: Ibid, 11, p. 124.

[3] Vincent: Bull. Soc. Chim., 40, p. 528.

Of the several recovery processes for sulphur from the tank waste of the Leblanc soda industry, only the Chance-Klaus[5] method has proved practical on a large scale. This can be so managed that a large part of the product is obtained as "flowers of sulphur," which finds a ready sale because of its purity and attractive appearance. But the process has not apparently met the original expectations of its promoters, for in 1894 England imported 20,100 tons of sulphur besides their imports of pyrites. Apparently about 12,000 or 15,000 tons are now recovered annually, though exact figures have not been obtainable. In 1893 the United States imported about 10,000 tons of sulphur from Great Britain, of which a considerable part was probably recovered sulphur.

The manufacture of wood-pulp by the sulphite process has stimulated the demand for sulphur within the past few years in this country.

Pyrites.

The use of pyrites for sulphuric acid is constantly increasing, but owing to the very low price of brimstone for the past two years, a few acid makers who had not destroyed their old brimstone burners, returned to the use of sulphur. Mr. K. F. Stahl[6] presented the relative merits of brimstone and pyrites, in a paper published about three years ago, and figured a difference of three cents per ton of 50°Bé acid, in favor of brimstone; but he based his estimate on pyrites at $6.00 per long ton. E. W. Parker[7] shows, however, that the actual cost of pyrites in 1893, was less than $3.50 per long ton and pyrites acid of 50°Bé really cost $5.00 per ton, against $6.25 for brimstone acid. Since our native pyrites are nearly free from arsenic and contain but little copper, there appears to be no good reason for the continued use of brimstone, except for a special acid free from all traces of arsenic, copper or zinc. Even at the present price of brimstone, the other items remaining the same, a decided advantage remains with the pyrites acid.

Improvements in the business have resulted in the production from pyrites of an iron oxide containing 1 to 2 percent of sulphur. This now finds a somewhat restricted use in the arts and as an iron ore. Residues from Spanish pyrites containing copper are of course valuable ores for that metal.

Sulphuric Acid.

The chief advances in sulphuric acid making have been in the improvement of details rather than in radical changes of apparatus or system. Mechanical furnaces have been introduced in some works recently, and generally give good results. They seem to be particularly good for burning "fines," since they allow no excessive introduction of air during raking. Muffle furnaces of the Spence type of mechanical burners have proved successful for roasting zinc blende, the muffle being heated by generator gas. The waste heat of the fire is utilized to heat the air by which the blende is oxidized. The ore is charged through a hopper into the top shelf of the burner and raked down by mechanical rakes from one shelf to the next. Some recent kilns of this kind will roast about 42 tons of ore carrying 28⅓ percent sulphur, in twenty-four hours, not more than 1 percent sulphur being left in the roasted ore. For making sulphuric acid, the gases from blende-roasting are treated in much the same way as those from pyrites. Since the amount of sulphur in blende is not sufficient to support the combustion, the roasting is accomplished by the aid of external application of heat to the muffles.

The Lunge-Rohrmann perforated plates are generally considered unsuitable for use in the Glover tower (though the inventors did not recommend them for this purpose),[8] because the high temperature would cause them to crack and impure gases might clog the openings. But placed in towers between the chambers they undoubtedly are effective. Their great cost, together with the fact that they offer considerable resistance to the movement of the gases, hinder their more general use. The "pipe columns" of Gilchrist[9] and Hacker have been introduced in several acid works in this country but in one case, at least, proved a failure. In other cases, however, under different conditions they seem to give very satisfactory results. Their chief advantage appears to be a more thorough mixing of the gases as they pass from one chamber to the next. The cause of the one failure above mentioned is attributed to improper placing of the towers, on the theory that their chief function is to cool the gases.

In some acid works, instead of steam jets in the outlet pipes, fans are used to assist in the movement of the gases, and give better results.

The more modern form of Glover tower has a steel frame and is lined with acid-resisting brick on tile. Quartz is still in favor as packing for these towers.

The general trend of improvement appears to be in the direction of smaller chambers and increased tower capacity. One of the latest ideas of this kind is embodied in Barbier's Tower System,[10] in which the lead chambers are entirely abolished and a system of towers substituted for making the acid. The scheme has hardly advanced beyond the experimental stage as yet, but gives promise of future importance. In this system the gases from sulphur or pyrites burners are led into a series of towers, five or six in number, connected by flues from the top of one tower to the bottom of the one adjacent. Beneath each tower is a pan for collecting the acid formed. These pans are set *en cascade*, so that the overflow is by gravity from one to the next, and all are set over a flue leading from a fire grate at the lower end of the series; or they may be heated by the sulphur dioxide gas on its way from the burners to the towers. The towers are filled with perforated pottery vessels of acid-resisting material, thus affording a large surface exposure. A sprinkler at the top of each tower supplies the dilute nitric acid needed. The last tower of the series is a Gay Lussac for absorbing the nitrogen oxides. As it is formed, the acid collects in the pans beneath the towers and flows from one to the next, always approaching the fire and becoming more concentrated in each pan, the denitration being accomplished at the same time. The water vapor and nitrogen gases pass off from the pans and immediately back into the towers. The final concentrating pan is set directly over the fire and not under any tower, and in it the acid reaches a gravity of about 60° Bé.

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[4] J. Soc. Chem. Ind., 1887, pp. 439, 442; 1889, p. 696.

[5] J. Soc. Chem. Ind., 1888, p. 163.

[6] J. Anal. Appl. Chem., 1892, p. 690.

[7] Mineral Resources of U. S., 1893, p. 745.

[8] J. Soc. Chem. Ind-, 1893, p. 232.

[9] J. Soc. Chem. Ind., 1894, p. 1142.

[10] P. de Boissieu: Bull. Soc. Chem., 11, p. 726. U. S. Patent No. 535882, March 19, 1895.

The advantages claimed for this system are, a more concentrated pan acid, free from nitrogen; larger yield per cubic meter of tower space compared with the cubic capacity of chambers; adaptability to use in both warm and cold climates, the temperature in the tower being high, (about 90° C); the cost of construction not exceeding one-half that for a chamber plant of the same daily output; and a much smaller ground area to be occupied.

While this particular apparatus may not prove entirely successful,[11] there seems no doubt that the tower system is in many ways superior to the chamber process and will probably be much developed in the near future.

Among improvements in the methods of concentration of the acid is to be noted that much of this is now done in the Glover tower, which is so constructed and managed that acid of 62° to 66° Bé may be obtained directly. In some cases two towers are in series, the one next the chambers being the denitrating tower and part of the acid from it is sent through the tower next the burners, by which the acid is concentrated up to 64° or 66° Bé, the steam passing along with the sulphur gases into the denitrating tower.

Kessler's[12] apparatus, in more or less modified form, is also being introduced for the concentration of acid. This is a continuous surface heating system used in connection with platinum or iron stills which are fired with generator gas or oil, and the waste fire gases passed over the surface of the acid contained in lead-lined iron tanks.

Cast iron stills are replacing platinum to a great extent, the acid being concentrated to about 64° Bé in the Glover tower and finished in the iron still. The results are very satisfactory and the life of a still is from two to six months.

Gold-lined platinum stills are used to some extent, but their great cost acts as a bar to a more extended application.

Another new idea is the abolition of the "acid-egg," a system of air-lifts similar to those used for raising water from artesian wells, being substituted.

[Am. Chem. Journ., 18, p. 420.]

Botany and Pharmacognosy.

Adulteration of Saffron.

César Chicote has found in saffron the petals of a Spanish species of *Dianthus* cut up and colored with acid fuchsin with the help of glucose. Since the bluish-red color is easily removed by water, the adulteration is easily detected.

[Pharm. Ztg., 41, p. 293; from Journ. de Pharm. et de Chim., 1896, p. 117.]

Poisoning by Cypripedium.

Prof. **D. T. MacDougal** reports that *Cypripedium pubescens* and *C. parviflorum* are capable of producing symptoms of poisoning in many people by simple contact of the foliage with the unprotected skin. The source of this action is located in the secretion found in the tips of abundant glandular hairs. The poisonous activity increases with the development of the plant, being greatest after the flowering period.

[Minn. Bot. Studies, Bull. 9, Part 7.]

Cultivation of the Date Palm.

Reports concerning the cultivation of the date palm (*Phoenix dactylifera*) in Australia show that in 1894–95, an eight year old tree in South Australia yielded 50 pounds of dates of good quality. In the West Indies trees four and a half years old were found in fruit. In March, 1891, at the botanical station, Copse Cross, near English Harbor, a quantity of date seed was planted and the seedlings were distributed to different stations. At Copse Cross, 86 date palms now exist. If the quality of the fruit is good, shipment to the United States will doubtless take place.

[Pharm. Ztg., 41, p. 258.]

Rhamnus Frangula L. in America.

Mr. W. M. Van Sickle of West New York, N. J., reports the discovery of specimens of this interesting European buckthorn in the swamp at Secaucus, some distance from the present known locality for this plant at New Durham. The problem concerning its mode of introduction into the United States is a difficult one to solve. The fact that Michaux's *Arboretum* was situated on the site of the present New Durham swamp indicates that it may have been originally planted there and thriving under favorable circumstances, spread rapidly and in time developed trees of the size now found. It was long ago reported from Flushing, Long Island, that this station is now apparently obliterated.

[Charles L. Pollard in Bot. Gaz., XXI (1896), 235.]

Opium Production in Macedonia and Persia.

According to consular reports from Salonica the cultivation of *Papaver somniferum* in Macedonia is increasing rapidly. In 1893, 37,500 lbs. of opium were exported from Salonica, in 1894, 157,000 lbs. Most of this opium goes to America, considerable to London, little to Germany and France.

In Persia in 1894, the district Ispahan produced 390,000 lbs., the exported opium (1600 chests) being estimated at a value of $625,000. The entire amount went to China. From Yezd, 530 boxes of 130 lbs. weight valued at $159,000 were exported. Opium from this region is most highly prized in Persia and during the poor yields of the last few years, opium from Ispahan and elsewhere has been worked over into the form characteristic for Yezd opium and sold as such.

The highest morphine content of Persian opium examined upon the spot was 12 percent.

[Pharm. Ztg., 41, p. 294.]

Quinine from Renewed Bark.

The report from the cinchona plantations of Java for the third quarter of 1895 gives tables which tend to show that the quinine-content even after several years does not reach that of the primary barks. From trees which yielded in 1891 a primary bark containing 8 to 11 percent, in 1895, in no case did the yield exceed three-fourths of the former figure. The highest yield was 7.13 percent against 10.71 percent. Even after 12 years of rest, in only 30 percent of the trees was an increase found, in 70 percent of the trees the quinine yield was one or two percent lower than in the primary bark.

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[11] Unsatisfactory results with this apparatus are reported from Italy. J. Soc. Chem. Ind., 1895, p. 698.

[12] J. Soc. Chem. Ind., 1892, p. 434, and 1895, p. 156.

[Pharm. Ztg., 41, p. 293; from Nederl. Tijdschr. voor Pharm., 8, p. 48.]

Alkaloids from Australian Solanaceæ.

According to the Lancet, Joseph Leuterer of Brisbane has investigated various Australian *Solanaceæ* with regard to their pupil-dilating alkaloids. Fresh, young leaves of *Duboisia myoporoides* contain scopolamine whereas the old leaves and stems contain hyoscyamine. The leaves are the richest in alkaloid constituents when the flowers are developing, containing 0.3 percent of the alkaloid; in winter, they fall off to one-tenth of that amount. Dry leaves contain 0.97 percent of alkaloid and are, therefore, stronger than belladonna leaves. Still richer is *Duboisia Leichardii*, F. v. Muell, which, according to Leuterer contains mainly scopolamine.

This is not in accord with results obtained by Jahns of Goettingen from material sent by Baron von Mueller. According to Jahns, this third *Duboisia* species contains only hyoscyamine. The alkaloid content, however, agrees, a fine specimen yielding two percent. From this, *Duboisia Leichardii* would seem to furnish excellent material for the preparation of hyoscyamine.

In the leaves of tropical species of thornapple cultivated in Queensland, *Datura arborea* and *D. Knightii*, the author found less alkaloid and this consisted of two-thirds hyoscyamine and one-third atropine.

[Pharm. Ztg., 41, p. 258.]

Indian Drink Plants.

In a recent article on the drink plants of the North American Indians, Dr. V. Havard brings out many interesting facts.

At the time of Columbus, the Indians north of Mexico had not learned to prepare alcoholic drinks. In Mexico, from time immemorial, the preparation of the national beverage, pulque, by allowing the sap of the *Agave Americana* to ferment, seems to have been practiced. The mescal, *vino mescal,* a drink obtained by distilling the heads of the *Agave* after previously baking, pounding and fermenting them, was unknown to the Aztecs who, like the other American aborigines, were ignorant of the art of distillation until it was introduced from Europe. They made a sort of mescal beer by merely omitting the distillation.

Maize furnished another stimulant. Even before the days of Columbus, corn was the principal crop of the agricultural Indians north of the Rio Grande, and it seems remarkable that, as the culture of corn spread to the northward from Mexico, the primitive art of making corn beer should never have accompanied it. It is also interesting that the roving, robbing Apaches, seldom planting corn themselves, should have been for several generations back extremely fond of tizwin, another alcoholic drink prepared from corn, while their agricultural neighbors with plenty of maize seem to have abstained. According to the best information, it is probable that the Apaches learned from Mexican Indians to prepare tizwin about the beginning of this century.

The fruit of the giant cactus, (*Cereus giganteus* Englem.) furnishes a clear light-brown syrup yielding a fermented liquor having the taste and smell of sour beer. Upon this liquor certain tribes get drunk once a year, continuing the revelry for a week or two at a time. As a matter of protection from each other and from hostile tribes, they take turns, one-third drinking, the others keeping guard.

The fruit of several species of *Opuntia*, prickly pear, yield an intoxicating drink called colonche. The yucca, mesquite, and other plants furnish still other drinks.

Several plants yield intoxicating principles not alcoholic.

A small, napiform, tuberculous cactus, (*Anhalonium Engelmanni* Lem.) two or three inches high is cut into slices by the Mexicans, dried and kept as a remedy for fever. It is used principally, however, as an intoxicant. A closely related genus contains a small cactus (*Lophophora Williamsii Lewinii* Coult.) covered above with hairy tufts, that is used similarly. The so-called "mescal buttons" concerning the effects of which investigators differ, also are intoxicating when chewed.

A beverage prepared by the Indians of Lower California from the leaves and seeds of *Datura* species first intoxicates then stupefies.

The red bean-like seed of *Sophora secundiflora* Engelm. contains an alkaloid, sophorine, which acts as a strong irritant-narcotic poison. Half a seed is said to produce a delirious exhilaration followed by a sleep lasting for two or three days. A whole seed is said to be fatal to a man.

Ilex vomitoriá Aiton, a handsome evergreen shrub near the coast southward from Virginia and along the Gulf, furnishes an infusion containing *caffeine*. Venable finds from 0.27 p. c. to 0.32 p. c. of this alkaloid in the leaves. This, with an added emetic, was formerly drunk by the Indians to cleanse themselves during certain religious festivals.

A number of palatable drinks designed merely to quench the thirst are mentioned. They are in most cases either the sweet sap from trees or have fruits as a basis. [Bull. Torrey Bot. Club, 23, p. 33.]

Practical Pharmacy.

Preparation of Ergotin (Yvon's).

500 g. of freshly powdered ergot are mixed with 1.5 g. of tartaric acid and 50 g. animal charcoal, then moistened with 50 g. of cherry-laurel water and sufficient more distilled water, and packed into a percolator. After macerating for 12 hours, it is extracted with about 3 litres of water to which a little cherry-laurel water has been added. The percolate is concentrated to a syrupy consistency on the water-bath, with constant stirring, and then mixed with 2.5 g. of chalk. After 12 hours, a small quantity of the mixture is dried to determine the water content, and enough 90° alcohol added to make a spirit of 75°. This is best done according to the formula $N = \frac{79.E}{21}$, where N is the

amount of alcohol to be added, and E the amount of water contained in the mixture. After stirring and macerating for 80 hours, the liquid is filtered, concentrated on the water-bath and 0.75 g. salicylic acid and enough cherry-laurel water added to make 500 g.

Ergotin so prepared is almost colorless and can be kept indefinitely. [Pharm. Centralhalle, 37, p. 248; from Journ. de Pharm.]

Substitution of Selenium for Sulphur.

Dumont recommends selenium to replace sulphur in ointments, claiming greater therapeutic value for the former. He prescribes: Selenium praecip. 2.0 g., Unguentum Paraffini 30.0 g.; misce.

[Pharm. Post, 28, p. 470; from l'Union Pharm.]

Eucasin.

Eucasin is a new compound made by passing ammonia gas over casein. It comes into the market as a fine powder, completely soluble in warm water. According to Salkowski, it has greater nutritive qualities than somatose, being absorbed to a much greater extent. While with other albuminous foods nuclein is also introduced, this is not the case with casein or eucasin. Since nuclein bodies especially favor the formation of uric acid, they should be avoided in rheumatism and similar diseases, and eucasin can find an application as a substitute for albuminous substances in such cases. It is administered in soups, bouillon, chocolate, etc.

[Zeitsch. des allg. österr. Apoth. Ver., from Deutsche med. Wochenschr.]

Erithrolum tetranitricum and Kresochine.

The tetranitric ester of the tetratomic alcohol erythrol is a new preparation recommended to replace nitroglycerin in diseases of the heart. Kresochine, a new antiseptic, has recently been put upon the market by Fr. Fritsche & Co. of Hamburg for the disinfection of instruments and for general disinfection on a large scale. According to the manufacturers, it consists of neutral tricresolsulphonate of quinoline and a loose combination of quinoline with tricresol. It contains 33% of quinoline and 17% of tricresol. Kresochine differs from the well-known soapcresol solutions in containing no alkalies, but containing the cresols and quinoline in a condition in which these substances can produce their highest bactericidal action. The preparation does not render the hands slippery, is neither caustic nor irritating, and dissolves to the extent of 5% in any water even when containing much lime. [Pharm. Ztg., 41, p. 304.]

Concerning Ostensibly "Non-poisonous" White-lead.

Under the name of "The new English non-poisonous white-lead," a firm in Glascow is selling a lead paint composed mainly of lead sulphate. That lead sulphate on account of its poor solubility is entirely non-poisonous has often been doubted, and recent experiments performed by Dr. H. Kionka of Breslau go to prove the opposite.

A preparation containing 97.64% of lead sulphate with some carbonate and other impurities, when administered to rabbits in doses of 10 g., proved fatal in 16–18 hours, while 2 g. daily caused death in 8 days. 10 g. fed a dog, caused vomiting and after daily repetitions of the dose, death ensued on the seventh day. This would show that the so-called "non-poisonous" white-lead acts as a local irritant and is absorbed by the mucous membrane of the stomach and of the intestines, causing symptoms of lead-poisoning.

[Apoth. Ztg., 11, 322; from Deutsche med. Wochenschr., 18, 281.]

Greek Letters in Prescription-writing.

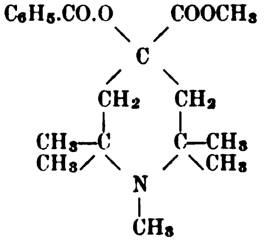
A new style of prescription-writing is recommended by Dr. Loeffler in the Aerzt. Korrespondenzblatt. The author calls attention to the fact that in prescribing the newer remedies, the names of most of which are familiar to the general public, the customary writing of prescriptions in the Latin language does not protect the physician from inconvenient criticisms of laymen, so that it often would seem advisable to adopt a style less intelligible to most persons. To this end Dr. Loeffler has used for some time the Greek alphabet though still retaining the Latin nomenclature, and in all the apothecary shops of Dresden his prescriptions are readily understood. E. g., he prescribes antipyrine as follows:

℞
ἀντιπυριν 1,0
Δ. ταλ. Δωσ. Νω. X.
Σ. Daily etc. etc.

[Pharm. Zgt., 41, p. 243.]

A New Local Anaesthetic.

Eucaïn, the methyl-ester of a benzoylated γ-Oxypiperidinecarbonic acid has been introduced as a new local anaesthetic and substitute for cocaine by the Chem. Fabrik auf Actien (vorm. E. Schering) of Berlin. It is cheaper than cocaine and harmless in medicinal doses. The name eucaïn has been adopted to take the place of the complicated chemical name, benzoylmethyltetramethyl-γ-oxypiperidincarbonicacidmethylester. Its constitution is represented by the formula:



The eucaïn base, like that of cocaine is almost insoluble in water and therefore useless therapeutically, but like cocaine it forms a readily soluble hydrochlöric acid salt.

Eucaïnum-hydrochloricum, $C_{19}H_{27}NO_4.HCl$. The hydrochloric acid salt of eucaïn is preferable to that of cocaine because its aqueous solutions can be boiled and therefore sterilized without decomposition, while cocaine by boiling is split up into benzoylecgonin and methylalcohol, thus losing its properties of a local anaesthetic, and becoming irritating to mucous membranes. Reichert used eucaïn in deseases of the throat and nose, and besides proving its qualities as a strong local anaesthetic, showed it to be without any action on the heart. Schleich showed that in solutions of 1–5% it was a perfect substitute for cocaine in anaesthesia of mucous membranes. Warnekros and Kiesel have employed eucain in dentistry (teeth-extraction, etc.), and found that while the heart was unaffected, the anaesthesia lasted longer and extended farther than with cocaine, and that solutions prepared with sterilized water could be kept indefinitely. In all their experiments they used a solution of 1 p. of the hydrochloric acid salt in 6½ p. of water. [Pharm. Post, 29, 192.]

Literary.

Books and Pamphlets Received.

Friedrich Vieweg und Sohn — Braunschweig. Die Terpene. Von Dr. Fr. Heusler, Privatdocenten der Chemie in Bonn. Ein Bd., pp. XII, 183. 1896. M. 5.00.

Field Columbian Museum — Chicago. Contribution to the Flora of Yucatan. By Charles Frederick Millspaugh, Curator of the Department of Botany, Field Columbian Museum. Publication 4, Botanical Series, Vol. I, No. 1. Brochure, pp. 56, with 4 plates.

Am. Pharm. Assn. — Baltimore. Proceedings of the American Pharmaceutical Association at the forty-third annual meeting held at Denver, Colorado, August, 1895. Also the constitution, by-laws and roll of members. 1 Vol., pp. XXIX, 1222. 1895.

—The National Formulary of Unofficial Peparations. Revised Edition. pp. XIII, 195. 1896.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesamten Technik und ihrer Hilfswissenschaften. Herausgegeben von Dr. Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Abbildungen. XII. Abtheilung. Dampfkessel — Destillationsvorrichtung. Bd. III, p. 161—320. 1896. M. 5.00. XIII. Abtheilung. Dilation—Dunkelkammer. Bd. III, p. 321—480. 1896. M. 5.00.

C. E. M. Pfeffer — Leipzig. Zeitschrift für Naturwissenschaften. Organ des naturwissenschaftlichen Vereins für Sachsen und Thüringen. Herausgegeben von Dr. G. Brandes. 68. Bd. Drittes und viertes Heft, pp. 161—320. Mit 1 Karte und 1 Figur im Text. 1895.

Julius Springer — Berlin. Vierteljahresschrift über die Fortschritte auf dem Gebiete der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Mit der Redaction beauftragt: Dr. A. Hilger. Zehnter Jahrgang. Das Jahr 1895. Viertes Heft. pp. XV, 485—677. 1896.

August Hirschwald — Berlin. Die Methoden der Milchuntersuchung für Aerzte, Chemiker und Hygieniker. Zusammengestellt von Dr. Paul Sommerfeld, chemischen Assistenten am Kaiser und Kaiserin Friedrich Kinderkrankenhaus zu Berlin. Ein Bd., pp. VI, 57. 1896.

H. Bechhold — Frankfurt am M. Anleitung zur ersten Hilfeleistung bei plötzlichen Unfällen. Von J. Hers und Dr. S. Mehler. Ein Bd., pp. 97. M. 1.00.

Josef Safár—Wien. Hilfstafeln zur Prüfung der chemischen Präparate. Auf Grund der Pharmacopœa austriaca ed. VII zusammengestellt von Dr. L. J. Panics, königl. serb. Militär-Apotheker. Ein Bd., pp. IV, 80. 1895.

Schimmel & Co. — Leipzig. Semi-Annual Report of Schimmel & Co. (Fritzsche Brothers), Leipzig and New York. April, 1896. Brochure, pp. 80, with a map.

McAuliffe and Booth — New York. Medicine as a Profession. By Dr. Louis F. Bishop. Pamphlet, pp. 8. Reprint from The Rutgers College Targum. 1896.

Author — Does Science need Secrecy? A reply to Prof. Porter and others of Harvard Medical School. By Dr. Albert Leffingwell, Cambridge, Mass. Pamphlet, pp. 26. 1896.

Schering and Glatz—New York. Apolysin, a new antipyretic and analgesic. Reprints of and abstracts from articles by Dr. Leon v. Neucki and Dr. J. v. Jaworski, Dr. R. Seifert, Dr. H. Hildebrandt, and Dr. L. Fischer. Pamphlet, pp. 40. 1896.

—Cereosote Carbonate in treatment of pulmonary tuberculosis. By Dr. Wm. H. Dukeman. Reprint from Medical News. Pamphlet, pp. 15.

—A new Form of Antiseptic Treatment of wounds. By Dr. C. L. Schleich. Translated from Therapeutische Monatshefte. pp. 4.

—The Guaiacol-Carbonate Treatment of Typhoid Fever. By Dr. S. Fraenkel. From Wiener Medizinische Blätter. pp. 4.

—Eucaine, a new local anæsthetic. By H. Kiesel, Dentist. From Zahnärztliche Rundschau. pp. 4.

—Vorotropin, a superior diuretic, uric acid solvent and remedy for calculous disease. By Dr. J. A. Flexner. From Am. Practitioner and News. pp. 4.

Stallman & Fulton—New York. Studies on the healing of wounds, with special reference to the iodine preparations. By Prof. N. Zuntz and Dr. E. R. W. Frank. Reprint from Am. Medico-Surgical Bulletin. Pamphlet, pp. 14.

—Nosophen Gauze as a substitute for iodoform gauze. By Dr. von Noorden. Reprint from Muenchener Medic. Wochenschrift. pp. 4.

—Nosophen. By Dr. R. Seifert. Reprint from Wiener Klin. Wochenschrift. Pamphlet, pp. 8.

Reviews.

Handwörterbuch der Pharmacie. Praktisches Handbuch für Apotheker, Aerzte, Drogisten und Fabrikanten. Unter Mitwirkung einer Anzahl Fachmänner herausgegeben von A. Brestowski. Verlag von Wilhelm Braumüller in Wien und Leipzig. 24. (Schlusslieferung). 1896.

With the 24th fasicle this comprehensive and exceedingly useful encyclopædia of pharmacy and the more closely connected medical and hygienic branches has been brought to its conclusion. This elaborate work has been in course of publication since about four years; the first volume was completed in the fall of 1893 and was reviewed in the December number of the Rundschau (p. 296) of that year. With the second, concluding volume, embracing 943 pages, a reference work of great value and of a most comprehensive nature is now placed before pharmacists, druggists and manufacturers, which will prove of paramount practical usefulness. In the daily practice and for ready reference this encyclopædia will almost replace a pharmaceutical library. Its use is greatly facilited by a comprehensive alphabetical index; its make-up is an elegant and substantial one; and the work is a credit to its authors as well as to its publishers.

Fr. H.

Prantl's Lehrbuch der Botanik, herausgegeben und neu bearbeitet von Dr. Ferd. Pax, Prof. der Botanik und Director des bot. Gartens in Breslau. One Vol., pp. 406, with 387 illustrations. 10th, enlarged Edition. Publ. by W. Engelmann, Leipzig. 1896.

The ninth edition of this work has been briefly reviewed and recommended on page 175, Vol. XII of this Journal. Although not yet translated and published in the English language, this text-book of botany is well deserving the consideration of students of botany as well as of pharmacy. Written and re-modelled by two succeeding eminent German professors of Botany and having passed through ten editions, the book has been perfected both in text and in illustrations. Compared with the preceding 9th edition, the present one has been augmented by 41 pages and 32 cuts.

The book is divided into the following general sections: Morphology (pp. 1—38), anatomy (pp. 38—101), physiology (pp. 101—148), systematic description of the families. This descriptive survey is arranged in accordance with the following systematic order: myxomiceta, thallophyta, archigoniata, phanerogama. A comprehensive index facilitates the use of the book. Print and paper correspond to the excellence of the work and its make-up.

Fr. H.

Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome premier A-B, 3e fiscicule, pp. 673—1046, avec gravures dans le texte. Ancienne Librairie Germer Bailière et Cie., Félix Alcan, éditeur. Paris. 1895. Fr. 8.50.

With fascicle three, volume one of this monumental work is completed and the reader can more fully realize what its scope and character is to be. The table of contents covers the letter A: one hundred and eighty-six articles written by more than thirty writers. Many of these articles are veritable monographs, closely related subjects sometimes being treated by several experts. Not only does this dictionary occupy a unique position in physiological literature, but in general scope and character as well as in the working out of details of individual articles it compares favorably with similar scientific works.

Fascicle three contains but few chemical subjects: arsenic, asparagine, atropine, nitrogen, etc., but these will prove of exceeding interest. The chemist does not expect to go to a dictionary of physiology for chemical information pure and simple. Under arsenic, for example, he will find a number of pages of exceeding interest on acute and chronic intoxication, the action of arsenic on the blood, etc., the theory of its action, the arsenic habit in Steiermark and Tirol. Under nitrogen and derivatives the most important subject from the physiological standpoint is that treating of the assimilation of nitrogen by plants, to which subject over forty pages are devoted. On the physical side the subject of hearing is treated at length, not less than ninety pages with numerous illustrations in the text being accorded this important subject. To the biologist the article on the assimilation of nitrogen by plants as well as that on bacteria, which is only begun in vol. one, are of special interest. Other articles treated more or less in detail are those on arteries, asphyxiation, assimilation, astigmatism, attenuation. Fascicle three, like the two that have preceeded it, is replete with interest.

E. K.

Proceedings of the American Pharmaceutical Association at the forty-third annual meeting, held at Denver, Colorado, August, 1895. Baltimore: Published by the Am. Pharm. Ass'n. One vol. pp. XXIX, 1222. 1895.

The National Formulary of Unofficial Preparations. Revised edition. By authority of the Am. Pharm. Ass'n. pp. XIII, 195. 1896.

Little can be said about this formidable volume that has not already been repeatedly stated in connection with earlier volumes of this annual. That like other volumes of its kind it has not been quick in making its appearance, is nothing new. Possibly few of those who have complained realize what it means to edit almost five hundred pages of association proceedings and papers, and to superintend the printing of a volume of over 1450 pages. Inasmuch as the proceedings of the Denver meetings have been reported in more or less detail by the pharmaceutical press and since the papers have been printed and even reprinted in a large number of journals, one half of the volume was largely familiar to the pharmaceutical public before the publication of the Proceedings. The Report on the Progress of Pharmacy, which virtually is the American Yearbook or Jahresbericht is new and of particular interest.

Yearly an enormous amount of work and considerable money is spent on this report. Whether a report that will satisfy a large majority of the members of the Am. Pharm. Ass'n., will ever be written is very doubtful. For one person to write such a report well is a herculean and ungrateful task. Without commenting on the report for 1895 in particular, the writer would rather emphasize what he stated on the subject of such reports in general in connection with the Jahresbericht of the German Apothecaries' Society only a few months ago, p. 69 of this journal.

E. K.

Die Terpene. Von Dr. Fr. Heusler, Privatdocenten der Chemie in Bonn. Friedrich Vieweg und Sohn, Braunschweig. Ein Bd., pp. XII, 183. 1896. M. 5.00.

It is little more than ten years ago that Wallach began his classic researches on terpenes and volatile oils which have gained for him the cognomen "Messiah of the terpenes" from Flückiger. Only those who have worked their way through the confusing literature of the half century preceding Wallach's investigations can realize the full significance of his labors. The most important result of Wallach's earlier work consisted in the characterization of the known terpenes and the systematizing of these hydrocarbons and their derivations. The light thus thrown on the subject seems to have invited further investigation of this interesting field on the part of others. The field that for a short time seemed to be monopolized by Wallach and his students has once more become common property, as it were, of a large number of chemists. A single number of last year's "Berichte" of the German Chemical Society contained almost one hundred pages on this subject from a number of authors. It may be added that Wallach's most important contributions do not appear in the Berichte but in the Annalen.

The facts with regard to "terpenes and camphors" have become almost legion, yet our true insight into the subject has not increased in the same ratio. In fact we seem to have entered another era of confusion. Ofttimes unwarranted deductions are drawn from facts and the same investigator who set up structural formulas one year is ready to mutilate his own dummy the next year. However, great benefit may be derived from such formulas if they are not based on mere guesswork, or even wrong observations, as has repeatedly been the case.

Under the existing circumstances every person who is directly or indirectly interested in the subject must have welcomed the news that a former assistant of Prof. Wallach had undertaken a compilation of facts pertaining to the subject. Although the author had not specialized in this chapter of organic chemistry, yet for a number of years he was in intimate touch with the work at Bonn and Goettingen and has had the assistance of two experts in this field.

With no up-to-date monograph on the subject almost any complete catalogue of facts would have been welcome. The book before us, however, is more than a mere catalogue, it is also critical in character. As to the arrangement of contents, something might be said in favor of an arrangement more in harmony with modern ideas of organic classification. Yet if we take into consideration that the constitution of not a single "terpene" is known with any great definiteness, the order followed is possibly as good for all present purposes as any that might be suggested. The whole subject is in a transitional stage and will no doubt soon emerge and receive due consideration from the systematists standpoint.

With regard to detail little need be said, so that it is remarkably well up to date. The "Terpenkünstler" as he has sometimes been called may here and there find something to improve or even correct, when viewed from his particular point of view. This might, however, occasionally prove an injustice to the author.

The monograph was originally written for the new "Handwörterbuch der Chemie" in the spring of 1895. The article was then brought up to date in February of this year and published as a separate book. The character of the book work of the firm is too well known to require any special comment. *E. K.*

Contribution to the Flora of Yucatan. By Charles Frederick Millspaugh, curator of the Department of Botany, Field Columbian Museum. Publication 4, Botanical Series Vol. I, No. 1. Brochure, pp. 56, with 4 plates.

Because of its geographical position and geological formation, Yucatan seems to offer especial attractions to the botanist. Despite its tropical position and the proximity of the Gulf Stream, it seems on the whole to be subject to long drouths and from the little known about it, its flora is rather scanty. To enlarge the knowledge concerning the plant life of this peninsula, Mr. Allison V. Armour of Chicago fitted out an expedition which brought back the plants making up a considerable part of the list enummerated.

Under the notes on the individual species, many points of interest to the pharmacist as well as to the botanist are to be noted. Half-tone plates illustrate a species of *Ficus*, also the papaya tree, *Carica papaya* L., both in its wild and in its cultivated state. A new species of *Euphorbia* is also figured. Since an increased knowledge of this flora bids fair to bring to light many interesting facts, further results will be gladly received.

Rodney H. True.

A Course of Home Study for Pharmacists. First lessons in the study of pharmacy. By Oscar Oldberg, Phar. D. The W. T. Keener Company, Chicago. One vol., pp. xxiv, 571, with 150 illustrations. Second edition, revised and enlarged. 1896. Cloth $3.00.

Although pharmacy as a profession will have to do away with the system of apprenticeship, there is no good reason for the hope that so-called pharmacy will soon outgrow its present tendencies toward commercialization. The abolishing of the requirement of practical experience on the part of all the university schools and even numerous colleges of pharmacy has done more than anything else to relegate to history a system that was at one time of the greatest importance, but which has now outlived itself.

The apprentice has for a long time been treated as a stepchild by most preceptors and the present movement toward a higher and broader pharmaceutical education will not tend to improve the conditions of his position. Nevertheless, as long as we must contend with this wellnigh mediaeval institution it may be well not to entirely neglect the training of these would-be pharmacists. The task is on the whole an ungrateful one, yet there are enough apprentices who aspire to something higher, to tempt at least some into the service of teaching the elements of pharmacy to these, on whole, unfortunate disciples of our calling.

That the author has not been discouraged in this task is shown by the fact that he has revised and enlarged his treatise. The preface is followed by an introduction containing some good paternal advice to the prospective student. The body of the book is divided into I. Elements of Pharmaceutical Physics; II. Elements of Chemistry; III. Materia Medica; and IV. Pharmacy.

The writer has had occasion to call attention to the fact that one of the short-comings of the apprenticeship system lay in the fact that the preceptor could not be expected to be a master in physics, chemistry, biology and their more applied pharmaceutical branches, such as pharmacognosy or materia medica, practical pharmacy, etc. This applies, though not with equal force, to the professional teacher who undertakes the instruction of apprentices: either in apprentice schools or through books.

For the same reason the writer may be excused from going into a criticism of the various parts of the book. Among the American books and other devices designed especially for the instruction of apprentices this work ranks among the best. The writer can without hesitation make this statement although he may not agree with the author e. g. in his exposition of the elements of chemistry.

The book-work is on the whole fair, but the printer has repeatedly been guilty of mechanical inaccuracies that are sometimes painful to the eye.

E. K.

Die Methoden der Milchuntersuchung für Aerzte, Chemiker und Hygieniker. Zusammengestellt von Dr. Paul Sommerfeld. Mit einem Vorwort von Dr. Adolf Baginsky. Verlag von August Hirschwald, Berlin. Ein Bd., pp. VI, 57, 1896.

This small book is intended especially for the use of "physicians, chemists and hygienists," and gives in a comprehensive manner methods of analysis for the various milk constituents and milk preservatives. The author has generally been fortunate in the selection of methods, at least from the stand-point of the German chemist. It would be difficult to find a chemist of any other nationality who would consider Soxhlet's areometric method "vorzüglich und ohne jede Schwierigkeit mit geringstem Zeitaufwand auszuführen." There is, however, no accounting for the preference of chemists in different countries for different methods of milk analysis. The English have their Adams' method, the Germans their Soxhlet, and the Americans their sand- or asbestos-extraction method.

The author passes over the rapid methods of fat determination in milk with a mere mention and appears to be under the impression that all of these require expensive machinery and are only adapted for use in large industries (Grossbetriebe), but this is not the case; perhaps ninety percent of the milk analyses made in this country at the present time are made by the Babcock milk test, an inexpensive, quick, accurate method not mentioned by the author, in spite of the fact that it is now used in German and other European dairies, butter and cheese factories. The method is admirably adapted for hospitals, food chemists, milk inspectors, etc.

The original Reichert method for determining the volatile fatty acids of milk-fat is given in the book, although this method is now never used by dairy or food chemists, having been superseded by the Wollny-Reichert method, which gives much more satisfactory results.

These and other points which might be mentioned, to some extent impair the value of the book; but generally speaking, the information given is reliable and the methods recommended up to date, including directions for the detection of preservatives like formaline, sodium fluorid and for the determination of microscopic impurities in milk. An outline of the bacteriological examination of milk is also given.

A few misprints were also noticed in reading through the book: p. 8, l. 3 f. b., 1.829 instead of 1.029; p. 14, l. 19, phosphoric acid for molybdic acid; p. 23, l. 3 f. b. Röse-Gottlieb method erroneously spoken of as a centrifugal method; p. 24, last line, *quecksilberamid*, for mercur-ammonium sulfate; p. 42, l. 3 f. b. 10 for 100.

F. W. Woll.

Anleitung zur ersten Hilfeleistung bei plötzlichen Unfällen. Für jedermann verständlich und von jedermann ausführbar. Unter Mitwirkung von Dr. S. Mehler, herausgegeben von Joseph Hers, ehem. Ober-Lazarethgehilfe d. Armee. Verlag von H. Bechhold, Frankfurt a. M. Ein Bd., pp. 93, mit 26 Abbildungen. M. 1.00.

This little work is a popular edition of the more elaborate and expensive work by the same authors. Several short chapters on the anatomy and physiology of the human body serve as an introduction and are intended to lead to an appreciation of why under given conditions certain things should be done, or, what is equally important, should not be done. The following chapters, twenty-six in all, give directions for first treatment to injured in cases of accident. The book is not intended to replace the physician, but is intended to give such information as may assist in alleviating pain or even saving the life of the patient before the physician can arrive.

The subject of first aid to the injured is receiving more and more attention in this age of machinery. Colleges of pharmacy are beginning to realize the importance of the subject and some are supplying courses of lectures. This little book, which, although greatly abbreviated, is comprehensive in its scope, is so cheap that readers of German will no longer have an excuse for not having a rudimentary knowledge of the subject. *E. K.*

Flora of West Virginia, by Charles Frederick Millspaugh and Lawrence William Nutall. Publication 9 of Field Columbian Museum, Botanical Series. Vol. I, No. 2. pp. 276. 3 plates. Chicago, 1896.

In this catalogue, we have the completed successor of the preliminary list, issued in 1892 by Dr. Millspaugh alone. It presents, as far as a list with the usual notes on points of especial interest is able, the flora of the state from the bacteria to the composites. As especially commendable features may be mentioned the departure from the antiquated arrangement of Gray's Manual, when dealing with the seed-bearing plants, and the introduction of two half-tone plates illustrative of *Betula nigra* L. and *Rhus radicans* L.

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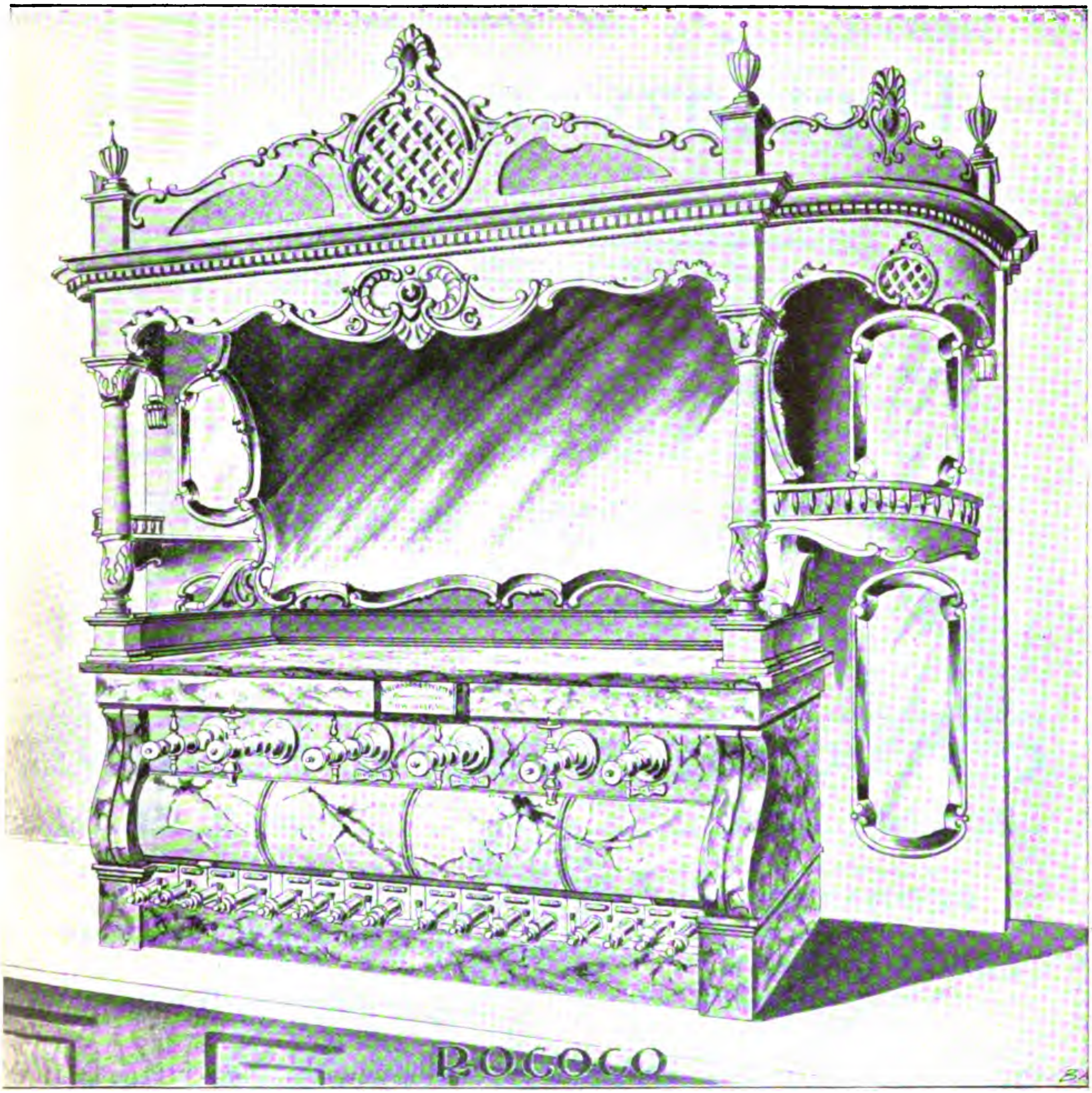

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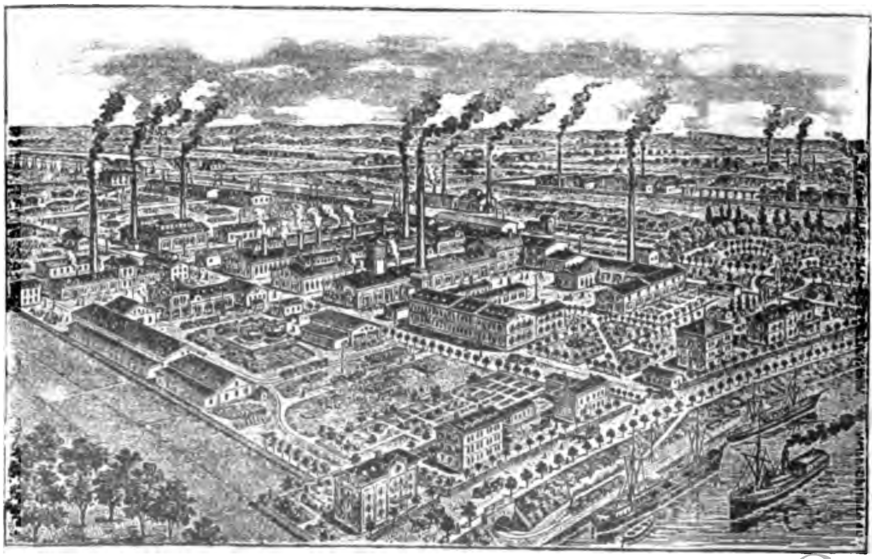

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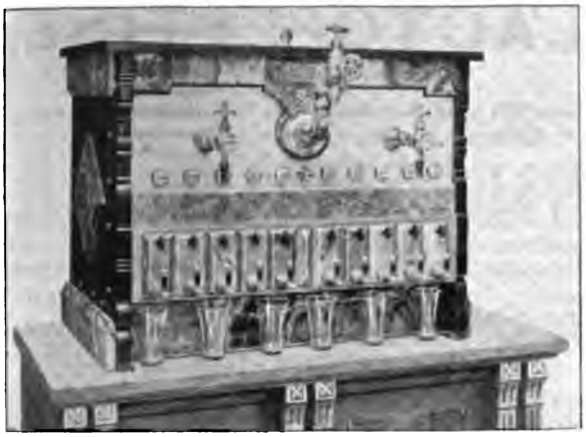

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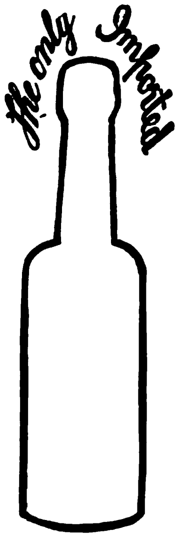

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Universities and Colleges.

University of Utrecht.

The University of Utrecht, Holland, will celebrate its 260th anniversary this year. The festivities will last from June 22. to 27. The principal feature will consist of the reproduction of a tournament arranged in Vienna in honor of emperor Maximilian in June 1560.

Leland Stanford University.

After three years' litigation over the estate of the late Senator Stanford, Mrs. Stanford has at last been enabled to pay the bequest of $2,500,000 which the senator left to Leland Stanford, Jr., university. This payment means an assured income to the institution. The bonds transferred to the university draw interest at the rate of $10,000 a month.

A Bogus Medical College.

Friends of sound medical education will be glad to learn that the Attorney-General of Wisconsin has brought a suit before the Supreme Court against the Wisconsin Eclectic Medical College of Milwaukee which has attracted wide attention through its circulars offering the sale of medical diplomas on the pretence of an examination. The college had no faculty, no library, no instruments, in fact nothing wherewith to carry on medical instruction.

Jurjew (Dorpat).

The expulsion of 96 pharmaceutical students from the University of Dorpat, Russia, by the minister of education has created a sensation. They are stated to have belonged to a society which existed in opposition to the rules of the University and which the rector pronounced anti-Russian in character. They were at the same time expelled from the city.

Homeopathy and Medical Education.

Dr. Schwartz of Cologne calls attention to the fact that homeopathy is no longer practiced according to the precepts of Hanemann, and can, therefore, no longer be considered a special medical discipline. He charges the Prussian cabinet-order of 1843, permitting the establishment of *Hausapotheken*, with class-legislation and points out that the disciples of Rademacher should have been given the same privilege if government action were at all consistent. He further claims that the self-dispensing of the homeopathists stimulates artificially the difference between the two schools. The regular pharmacist should prepare homeopathic prescriptions as well as those of the so-called regular school, in fact it is his duty to prepare both classes with equal care. There is no need of special homeopathic schools, of homeopathic self-dispensing, of homeopathic house-pharmacies etc., but the universities should provide sufficient instruction in the teachings of Hahneman and the preparation of homeopathic remedies to medical and pharmaceutical students respectively.

Institute Pasteur.

The Institute Pasteur, Paris, has just published its report for 1895. The salient feature of the statement appears to be that of 1523 persons treated only 5 succumbed to the injuries. In the fatal cases the symptoms of rabies manifested themselves within fifteen days after the first inocculation; one patient, however, was seized with rabies during the course of the treatment, and has not been included in the figures. A table of statistics contains the figures commencing from 1886, showing that of the 2671 persons treated in that year 25 died, or a mortality of 0.94 percent, while in 1895, of the 1523 treated only 2 died, or a mortality of 0.13 percent.

University of Wisconsin.

The board of regents of the University of Wisconsin has recently made the following promotions in the faculty of the School of Pharmacy:

Lellen S. Cheney, B. S., from instructor in general and pharmaceutical botany to assistant professor of pharmaceutical botany.

Rodney H. True, Ph. D., from instructor in pharmacognosy to assistant professor of pharmacognosy.

Pharmaceutical Commencements.

The Department of Pharmacy of the Northwestern University will hold its annual commencement June 11 at the Auditorium, Chicago.

The fourth week in June will be commencement-week at Michigan and Wisconsin.

The College of Pharmacy of the City of New York held the exercises of the sixty-sixth annual commencement May 7, at the Carnegie Music Hall.

The Pharmaceutical Department of the University of Buffalo held its annual commencement May 5.

The Chicago College of Pharmacy bestowed the degree of Pharmaceutical Chemist upon five, and the degree of Graduate in Pharmacy upon thirty-five of its graduates April 23, at the commencement exercises held in the Schiller Theatre.

Miscellaneous.

The University of Wuerzburg has now a chair in the history of medicine.

Ant. Voga, apothecary in Steinamanger, Austria, has endowed a fund of 5000 fl. for the support of poor pharmaceutical students.

Dr. E. Buchner, docent at the University of Kiel, has been appointed extraordinary professor of inorganic and pharmaceutical chemistry at the University of Tuebingen.

Acting on the advice of several eminent physicians and surgeons, A. A. C. Swinton has decided to equip a special laboratory at 66 Victoria Street, Westminster, S. W., for the practical application of the Roentgen rays in surgery and medicine.

Scientific Societies and Boards.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Indiana	June 3	Indianapolis	A. Timberlake, Indianapolis.
Kentucky	June 16	Estill Spring	J. W. Gayle, Francfort.
Maine	June	Rockland	C. A. Fowler, Bangor.
Massachusetts	June 16	Pittsfield	J. F. Guerin, Worcester.
Minnesota	June 16	Lake Minnetonka	C. T. Heller, St. Paul.
Missouri	June 9	Excelsior Springs	H. M. Whelpley, St. Louis.
Nebraska	June 2	Lincoln	W. S. Heilman, Tecumseh.
New York	June 23	Buffalo	C. W. Holmes, Elmira.
Ohio	June	Put in Bay	S. C. Hopp, Cleveland.
Pennsylvania	June 9	Gettysburg	J. A. Miller, Harrisburg.
Utah	June 11	Salt Lake	C. H. McCoy, Salt Lake City.

National Academy of Sciences.

The spring meeting of this distinguished association was held in Washington for four days, beginning on April 21.

A considerable number of papers read had one phase or other of the X-rays for their subject. T. C. Mendenhall read a timely paper on the Legislation relating to standards. Although it was possible to elect five new members at this meeting, only two names were accepted: Charles D. Walcott, director of the U. S. Geological Survey, and Robert S. Woodward, professor of mechanics in Columbia University.

The French Academy of Medicine has received a donation of 800,000 francs from Mrs. Audiffred. The interest, or 24,000 francs, is to be paid as a life annuity to a Frenchman or a foreigner, who discovers a specific against tuberculosis of the lungs.

The apothecaries of Hamburg-Altona have united under the motto "Beharrlichkeit führt zum Ziel" (Perseverance conquers) to assist in the demand for the "Maturitätszeugniss" (graduation from the gymnasium) as the fundamental requirement for the pharmaceutical career.

At the final meeting of the New York Section of Society of Chemical Industry a paper on "The education of Chemists" was read by Dr. G. Duisberg. Comp. this journal p. 49.]

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Colorado	Denver	June 12	C. H. Wells, Pueblo.
Michigan	Detroit	June 22	F. W. R. Perry, Detroit.
New York	Syracuse	June 19	E. S. Dawson, Jr., Syracuse.
Oregon	Portland	June 9	D. J. Fry, Salem.
Washington	Seattle	June 8	W. H. T. Barnes, Seattle.
Wisconsin	Madison	June 26	E. B. Heimstreet, Janesville.
Illinois	Chicago	June 16	Frank Fleury, Springfield.
Maine	Augusta	June 10	Fr. P. Partridge, Augusta.

History.

The Hundredth Anniversary of Homeopathy.

Homeopathy this year celebrates its hundredth anniversary. Parts 3 and 4 of Hufeland's journal, Journal der praktischen Arzneikunde und Wundarzneikunst, for 1796 contained an article by Hahnemann: Versuch über ein neues Prinzip zur Auffindung der Heilkräfte der Arzneisubstanzen, neben einigen Blicken auf die bisherigen", which is considered as the genesis of the homeopathic method of curing disease. Homeopathy (from homoia homeio i. d. = similia similibus) resulted as a reaction against the then existing speculative and mystical tendency of medicine and the poly-prescription of physicians. The pharmacotherapy of the regular school at the time of Hahnemann was extremely crude and often did more harm than good, so that, according to Kobert, the change to homeopathy resulted, at that time, in benefit to the patient.

During the past century a complete literature on homeopathy has been created, and this school has had as many violent opponents as devoted disciples. In Prussia, the practice of homeopathy was regulated by the state in 1843. In America homeopathy has, however, found its most fertile field. Whereas Europe maintains homeopathic chairs at Paris, London, Budapest and Madrid, America has a number of homeopathic colleges, and homeopathic hospitals in almost all of the larger cities. Nevertheless, there are about five hundred homeopathic physicians in Germany, and about three hundred homeopathic societies among the laity. Central pharmacies exist in Leipzig, Dresden and Stuttgart.

Expositions.

Second International Exposition at Prag.

The second group (see p. 43) is to contain the modern literature on pharmacy, pharmacognosy, botany and chemistry. Authors and publishers are requested to contribute to this group by sending copies of their works: books, journals, maps etc. The exhibit will be arranged in form of a reading room. No charges will be made unless special arrangement is demanded. For information apply to Emil Graf, Prag, II., Nr. 89, or O. Schreiber, Prag, III., Nr. 203.

Pharmacy at the Exposition in Budapest.

There will be no lack of pharmaceutical expositions in Europe during the coming summer. Section four of the Hungarian millenium exposition will be given to pharmacology and pharmacy.

Personals.

Dr. Hermann Hager has been elected honorary member by the pharmaceutical societies of Moskow and Warsau.

Prof. Behring of Marburg has not announced courses of lectures for the present summer-semester. It is rumored that he expects to withdraw from his duties as professor.

Dr. F. B. Power sailed for Europe Tuesday, May 12, on the North German Lloyd steamship Lahn. He will stop at London before he goes to the continent.

Bibliography.

Ginn & Co., Boston, who have recently issued "Chemical Experiments" by R. P. Williams, now have in press a textbook of Chemical Science by the same author.

Macmillan & Co. announce the completion of the Dictionary of Solubilities Inorganic by Dr. Arthur M. Comey, formerly professor of chemistry, Tuft's College.

The Deutsche Verlags-Anstalt has determined to increase the scope and size of the excellent "Lexikon der gesamten Technik und ihrer Hilfswissenschaften". It was first intended to publish the work in five volumes, but the work has been growing in the hands of the editor, Dr. Lueger, and his host of colaborers so that the publishers do not expect to complete the work in seven volumes. Subscribers, however, will be pleased to learn that anything beyond the seven volumes will be furnished free of cost to them.

The Scientific American will celebrate its fiftieth anniversary this year by issuing a special number July 25. A prize of $250.00 is offered for the best paper on "The progress of invention during the past fifty years."

The new third edition of the Norwegian Pharmacopœa appeared April 1 and went into force at once. The first edition of 1854, the second edition of 1871 and the *Additamenta* of 1879 were printed in the Latin language. The third edition, however, is printed in the Norwegian language.

Geo. Brumder, the publisher of "Our Native Birds of Song and Beauty" by Henry Nehrling, expects to complete this work before the close of the year. The third last number is now in press. The German work has been received most enthusiastically. The English work, which is by no means a mere translation, will no doubt be welcomed by all lovers of our American songsters, who, on account of the language, were barred from enjoying the German edition.

W. T. Keener & Co. of Chicago announce the approaching completion of Prof. Oldberg's new book, The General Principles of Pharmacy. It is to be a textbook of the scientific principles of pharmaceutical practice and the technique of pharmacy.

The third and fourth numbers of the Zeitschrift für Naturwissenschaften, which is the organ of the Naturwissenschaftlicher Verein für Sachsen und Thüringen contains the following original contributions:

"Mittheilungen von einer Reise nach dem Woodtlande und dem Salzwerk zu Bex, mit 1 Karte," by Geh. Bergrath and D. Cramer.

"Ueber Calciumcarbid und Acetylengas," by Prof. Hugo Erdmann.

"Nebenwirkungen von Arznei- und Genussmittel und Giften," by Dr. Roth.

"Verschleppte Schlangen in der Provinz Sachsen," by Dr. med. Schnee.

Commercial.

The Farbwerke at Hoechst near Frankfurt again leads the German chemical industries in the way of profits, which amounted to 6,191,475 Marks. A dividend of 28 p. c. was declared. The antipyrine patent of the factory expires in two years.

The Wisconsin Pharmacal Mfg. Co. has selected Milwaukee as the place for the location of its factory. Work is to begin as soon as the balance of stock is subscribed. Applications for stock should be made to Mr. A. F. Menges, Treasurer, Madison, Wis.

Friends of pure drugs and chemicals were glad to learn that the firm of Fritzsche Bros. of New York came out ahead in their recent vanillin case. In the absence of public stations the work of individuals and firms who expose frauds is of the greatest service to the public. That such persons and firms should be annoyed by law-suits is, possibly, inevitable, but we have reason to congratulate them as well as ourselves whenever fraud receives the rebuke of the law in addition to exposure.

Frederick Stearns & Co. have recently gained a victory over a secret nostrum fraud in the famous "Syrup of Figs" case. The words "Fig" and "Syrup" in combination were claimed as private property for trade mark purposes by the California Fig Syrup Co. It may be of interest to note in connection with this celebrated case that undue protection in this line has also received a set-back in German courts. Application had been made under the new "Wort-schutz" law of Germany for the registration of the word phenacetine. This was at first granted, but upon further investigation it was repealed.

Industrial Activity during 1895.

That the year 1895 has witnessed commercial activity on the incline, is shown by the statistical report of the principal nations.

The experience of England, being the principal market of the world, and therefore influenced most and quickest by the commercial events in all parts of the world, is most instructive in this respect. The Reports on British Commerce for 1895 compare with those of 1894 as follows:

	Imports.		Exports.		
	1894	1895	1894	1895	
1st half.......	211	203	137	136	million £.
2nd half......	197	213	137	150	million £.
Total..........	408	416	274	286	million £.

This shows that the depression which prevailed during 1894 had not been overcome at the beginning of 1895, but that it made way for a decided revival as the year progressed. Of the total exports of 286 million £ 226 million were British products, the balance re-exported foreign and colonial products.

Exports of British products varied during the last seven years as follows:

	Increase.	Decrease.
1889............................	3.71%	....
1890............................	....	0.51%
1891............................	....	5.30%
1892............................	....	3.43%
1893............................	....	2.10%
1894............................	3.35%	....
1895............................	8.57%	....

This is an interesting illustration of the fluctuation which commerce made during the last years.

In the U. S. whose commerce is in the closest relation to that of England and continental Europe, a marked improvement in business is noticeable, which increases more rapidly as the year advances. Imports decreased from 841 million dollars in 1892 to 776 in 1893 and 676 in 1894, while during 1895 they increased to 801 millions. Exports during 1894 and 1895 were equal at about 824 million dollars in which the decrease in the value of exported cotton, livestock and provisions, was about offset by the increase in value of exported petroleum (in diminished quantity) and other smaller articles. During the last 3 months of 1895 the increase in exports over those of the corresponding months of 1894 was 12, 24 and 30 million dollars respectively.

The changes in the commerce of the German Empire during the last year can be seen only partially at the present time, inasmuch as the computation of the exports and imports at the actual prices for 1895 is now in progress, and that at the present time it is impossible to tell how much of the change is due to quantitative increase or decrease and how much is due to the fluctuation of prices.

The value of exports and imports for the last two years compares as follows:

	Imports.	Exports.
1894......................	4285	3051 mil. marks.
1895......................	4216	3416 mil. marks.
More......................	1	365 mil. marks.
Less.......................	69	...... mil. marks.

This comparison changes somewhat when deducting precious metals. There results a loss of imports of 349 million. In the first figure spun articles have a large share and in the latter woven goods; the products of the chemical industry also have contributed largely to the increase of exports, and amounts to 38 million of drugs, druggist's and dyer's materials.

In the revenue domain of Austro-Hungary the imports exclusive of precious metals amounted to 727 million gulden (against 700 million in 1894) and exports 742 million gulden (against 795 million in 1894). The decrease of exports is mostly in agricultural products, whereas industrial products show a slight increase in exports.

The statistics of French commerce show imports for 3699 million francs (against 3850 million in 1894) and exports of 3388 million francs (against 3078 million in 1894). The demand of imports decreased mainly in articles of food (to the extent of 172 million francs) while the increase in exports is attributable to raw and auxiliary materials for manufactures to the extent of 112 million francs and to finished manufactures to the amount of 209 million francs.

This short review of the commercial statistics of five leading countries, justifies by figures the assertion that the year 1895 can be considered as marking the beginning of a revival of industrial activity.

The effect of this increased activity upon prices cannot be accurately ascertained at this time so long as actual values for 1895 have not been computed.

[Commercial Report of Gehe & Co., Dresden.]

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Sanitation and Hygiene.

Leprosy in America.

A year or more ago the fate of a poor leprous Chinaman, who was compelled to live alone in a rude hut on an island near New York, and who perished miserably by finally refusing to partake of the food passed in at the door of his living tomb, attracted considerable attention. There are now four patients living in a temporary lazaretto. One is a Chinaman, two are negroes and the fourth is an Italian, but now a citizen of the United States. The editor of the Medical News calls attention to the peculiar fact that so many leprous patients, who have come under his observation or of whom he has kept a record, were cooks.

According to a newspaper clipping, a seventeen-year-old boy, an orphan, in Grand Forks County, North Dakota, has been ejected by society to live alone. The editor justly questions whether we are living at the threshold of the twentieth century in a Christian land.

In Louisiana, where the necessity for action has become imperative, a hospital has been established on the Mississippi, made up of eight cottages surrounding a fine old plantation house; but in spite of the "Arcadian scenery" and other attractions of the place, which offers accomodations for one hundred inmates, few can be induced, without the use of force, to avail themselves of it. From recent reports the disease would appear to be increasing at the expense of the native-born population in and about New Orleans, and it would seem to be as much a matter of national as of state interest to check its spread. As far back as 1888 Dr. Blanc reported forty-two cases of leprosy.

As to the existence of leprosy in countries upon our borders it is to be found in Canada, British Columbia, Mexico, Cuba and the West Indies in general. In Havana a leper house was established as early as 1681, but the disease had begun to diminish until a decided Chinese immigration set in. Now it is difficult to say how many lepers are on the island, but the hospital itself usually shows a census of a little less than one hundred. In Jamaica the leper population has been estimated at 450, or 1 to each 1380 of the residents of the island. [The Med. News, 68, p. 297.]

A new lazaretto costing about $20,000 was recently erected at Tracadie, N. B. There are now nine male and sixteen female patients in the hospital. Nine lepers now held in confinement in British Columbia are to be added to this number. For many years Dr. A. C. Smith has been in charge of this institution. Regarding the result of his experience with leprous patients, he says that no specific cure for leprosy has yet been discovered. His predecessor, Dr. Nicholson, and also Dr. Smith treated several of the lepers with colored water, to see if the influence of the mind over the body would cause a change, and in every instance it did so. For a time all symptoms of the disease were in abeyance and there was a decided improvement, but this was only for a time, and it seemed as though the disease made up for lost time afterwards. [Medical Record, 49, p.309.]

According to F. F. Wesbrook, direct sunlight destroys cholera bacilli if they are in contact with air, but aids by its heating power the growth of those not in free contact with air.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis. as second class matter.

Vol. 14, No. 7. **JULY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 7. **JULY, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
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EDITORIAL.

Charlatanism in Medical Education.

"To grasp the spirit of Medicine is easy:
Learn of the great and little world your fill,
To let it go at last, so please ye,
Just as God will!
In vain that through the realms of science you may drift;
Each one learns only—just what learn he can;
Yet he who grasps the Moment's gift,
He is the proper man."

The above quotation from Faust is part of the counsel of Mephistopheles to the student. While dispensing advice to the novice in answer to his queries concerning the theological and legal faculties, Mephisto maintains at least the semblance of an ardent pedagogue. As the student asks for a "kräftig Wörtchen" about medicine, the true devilish spirit gains the upper hand and he makes the above quoted remarks.

These words were possible only in the mouth of a person who knew how over-credulous people are in matters pertaining to the healing art. In this satanic advice lies also the hint that the goal of success lies along the road of charlatanism.

What was true in this respect in Goethe's time is equally true to-day. The people of the *fin de siècle* will as readily sacrifice reason for the elixir of life as those who were willing to be defrauded by alchemist or astrologer. Physicians knowing this to be true, admit that medicine offers a better field for charlatanism than any other profession. The greatest charlatan the world possibly has ever seen, died a multi-millionaire only a few weeks ago.

If the success of charlatanism tempted the student in Faust, it is equally a temptation to the men and women of to-day. The desire for gain, the ambition to be looked up to as a superior person by the people often tempts even the educated physician to take steps that must be pronounced unethical. The number of physicians and surgeons, who give to the reporter the results of their quasi-discoveries or marvelous operations is by no means small. If this is true of the "regular" physician who prides himself that he will not associate with the "irregular or dogmatic", what may be expected of those whose desire for gain is not checked by a strong professional spirit?

The daily press, this boasted educator of the people, not only creates and fosters that kind of charlatanism of the "regular" physician already alluded to, but it daily spreads the poison of secrecy in medicine and the abomination of self-medication with vile concoctions.

That a people whose ethical conception of a noble profession is daily thwarted by villainous literature for which the daily papers are richly paid, should witness complacently fraud and charlatanism of the worst sort even in medical education, is but the natural outcome of the popular education alluded to. Under these conditions it is rather surprising that the state after having granted a charter to a questionable organization, should take steps to revoke its action by withdrawing the charter after considerable harm has been done.

A month ago attention was called to the fact that the attorney-general of Wisconsin had begun action against the Wisconsin Eclectic College of Milwaukee. As ground for his action he states that this so-called college has no faculty, no library, no apparatus, in fact is no educational institution at all, but a mere business enterprise, selling medical diplomas under a charter unfortunately granted by the state.

The circular of the college, with a sarcasm that would do credit to Mephisto himself, is "respectfully dedicated to the thinking citizens of the United States of America." It appeals for support to those who as druggists, nurses, or "students" in medical offices have obtained a sprinkling of medical knowledge and denounces as "absurd, unjust and unreasonable" the requirement of resident study by the "monopoly colleges". It boasts of its legal status and in large letters calls attention to the fact that "it is possible for students to graduate without attendance," also that "the title of M. D. always raises the individual in the social scale, no matter who he or she may be. It also gives to its owner a position and a general authority which is absolutely unattainable by any other means."

That a circular of the Wisconsin Eclectic Medical Society should be permitted to accompany such a prospectus is certainly to be regretted. If physicians were to quit quarreling among themselves; if the reputable element of the various schools could be made to unite for the purpose of state legislation, not for themselves but for the benefit of the people; if a state board of medical examiners had orders to examine all candidates no matter where they got their M. D., much of the damage done by such institutions could be undone. It must, however, be stated to the credit of the Wisconsin Eclectic Medical Society, that the steps taken by the state were taken at the solicitation of the officers of this association.

The reader may inquire of what particular interest a bogus medical college is to pharmacists. The answer lies in the circular letter addressed to pharmacists by this college, of which a copy is given below:—

> "DEAR SIR:—If you have any aspirations to a profession which runs side by side with that of Pharmacy, if you desire to become a physician and have the legal right to append M. D. to your name; then you are politely requested to carefully read and digest the contents of the inclosed prospectus.
>
> "The plan as outlined therein gives to the pharmacist an open door, to the legitimate practice of medicine, as an authorized physician. In these days when the Pharmacist is required by law to be as highly educated, as well read, as well versed in the various branches of Medical Knowledge and to pass as rigid an examination (and in some states much more rigid) than is required of the physician; is there, we ask, any reason why the pharmacist should not avail himself of the opportunity (while he has it) to take yet another step on the ladder of life and become M. D.?
>
> "The average pharmacist's knowledge of Materia Medica, Therapeutics, Anatomy, Physiology, Science and Practice of medicine, Obstetrics and Surgery is usually just as good as the average physician, indeed many much better, for there are thousands of practising physicians who never had a diploma, never was asked a question on the subject; while every pharmacist has been through the fires of inquisitorial examination."

This circular letter speaks for itself and requires no comment, not even on its English.

The writer has received inquiries from pharmacists as distant as New York about the character of this institution. It may not be amiss to warn all pharmacists, who have a grain of selfrespect, against the temptations of this institution.*

E. K.

Professional Pharmacy and Unrestricted Competition.

The statement that excessive business competition has the tendency to destroy any professional element in the modern pharmacist has evoked the following comment: "The pressure of competition is now and has always acted as the minister of natural selection. It kills off the unfit and leaves the adapted in possession of the field." If ability or fitness refers to business skill or sagacity or even shrewdness, this no doubt is partly true. The observation can be made almost anywhere that e. g. an old reliable firm is reduced to the verge of bankruptcy because it has avoided distasteful methods of advertising to attract the public. No one will doubt that the articles bought at the old stand are reliable, that the veteran chief clerks at the head of the various departments thoroughly know the kind of goods they are daily buying and selling. On the other hand a new competing firm managed according to so-called "modern business principles" does a flourishing business. It is generally acknowledged that this firm keeps good, bad and indifferent goods and that it makes its fortune by disposing of the poor goods to a credulous public blinded by the cheapness of the price and attracted by extravagant advertisements. The goods in this store are no longer bought but sold. It is further recognized that the cheap help of the advertising firm is paid largely for the amount of gas it can produce and not for the knowledge of goods it is handling. Yet the modern swindler comes out ahead and the honest, conservative dealer has to give up his business or surrender his business principles and do like his competitor. This according to our commentator evidently is the business ability that brings the best to the top and kills off the worthless and deficient. An observing lawyer recently remarked that if advertisers (referring particularly to those of so-called patent and proprietary medicines) had to pay into the United States treasury ten cents for every lie they said, our government would not be in need of revenue. A sad comment on modern "business ability" indeed.

---

* The writer has since been informed that this mercenary college has changed its base of operations to 1001 West Congress Street, Chicago.

The survival of the fittest in business is a great lie if by fit we understand honorable qualities.

What is true of the general merchant is even more true of learned professions and particularly of those callings that combine the professional and commercial elements. The medical and legal professions would not to-day be what they are if they were wholly unrestricted. The rank and file in these callings is not what it should be, but it has been raised from a cruder condition by educational requirements, and will be improved in the future by higher educational standards and not by competition with charlatans.

The druggist is in a particularly precarious position. The commercial element cannot be wholly excluded from his calling. The very fact, however, that we now have pharmaceutical legislation of one sort or another in almost every state of the union clearly demonstrates the fact that the people at large do not believe that competition alone will weed out the poor element and leave the fittest to render service to suffering humanity. Pharmaceutical legislation on the whole is not class legislation, If anything it is directed against the druggists, as many in recent years have learned. Pharmaceutical legislation is for the benefit and safety of the public. Pharmaceutical legislation implies restriction, not unrestricted competition. As in medicine and law restriction in pharmacy in this country is not based on concessions, but purely on an educational qualification, however meagre this may be.

Within the past year a pharmacist went on record with the following statement: "It is absolutely impossible for us to inspect all the drugs that we buy and sell." He evidently spoke not only for himself but for his fellow-druggists as well. What this admission of guilt implied he was immediately informed of and he apparently had nothing more to say. The confession "that it is absolutely impossible for us to inspect all the drugs that we buy and sell" was an honest confession. Not only are most druggists educationally unqualified to perform such a task, but such an undertaking would be ruinous from a business standpoint. Competition is such that it does not "pay" to go to college, or if the aspirant goes he cannot afford to spend more than two or three winters, often working during the greater part of the day in drug stores in order to pay his way through college. After he has his coveted diploma it again does not "pay" to keep a "drug store" true to its name, but he must keep soda-water and he must advertise it. He must have cigars, toilet articles and hundreds of other things and he must advertise them. While inventing new schemes for advertisement he has no time to examine the drugs he buys and sells. The writer has not yet learned of the druggist who advertised that he examined every drug which he purchased and that he dispensed none but those which came up to the standard. It is rather strange that if the survival of the fittest applies to pharmacy, that those drug journals, which have in recent years given so many "tips on advertising" have not emphasized this style of advertising and that druggists have not been glad to follow such advice.

The bitter truth is — and the sooner those looking after pharmaceutical legislation swallow this pill without sugar coating the better — that there is too much competition in pharmacy. Don't quarrel about "patent medicines". They are unethical and the sooner they are thrown out of the drug stores the better for the druggists. Many druggists already feel ashamed of them and place them where they are not conspicuous. The cutting evil in general has been discussed year after year and every year invents new schemes to subdue this evil. Remove competition and this will regulate itself. The cutter is not the benefactor of the public. He not only sells remedies cheap, but he also sells cheap remedies. The fundamental idea of all pharmaceutical legislation, the protection of the public, is so little served by our present laws, because they allow excessive competition to go on unrestricted. If the number of druggists is reduced by a high educational standard, pharmacists will not only be able to give all their time and attention to drugs, but they will also be able and willing to examine all the drugs they buy and sell and to assume responsibility for their acts. Under the banner of free and unrestricted competition this has never been possible. The engineer who constructs a faulty bridge will be found out. His case is a simple one. The physician may prescribe a faulty prescription and the pharmacist may compound it. Perchance they may be found out. Chances are in nine cases out of ten they will not be found out. Herein lies the difference between the profession of engineering and that of medicine and pharmacy. The ignorant engineer is soon recognized as such; the charlatan flourishes beside the medical expert; the druggist, who knows nothing about drugs, save their names, their price and how to advertise them, beside him who would be a true servant to the people.

> "Eleuchtet das Jahrhundert ist,
> Der Esel Stroh und Disteln frisst."

E. K.

ORIGINAL CONTRIBUTIONS.

The Periodides of the Alkaloids, as Molecular Forms for Volumetric or Gravimetric Estimation.*

By Dr. *Albert B. Prescott.*

RECENTLY PUBLISHED WORK ON PERHALIDES.

Returning now to periodides and their halogen relatives, a few references should be given. A pentaiodide of caesium, and teriodides of caesium and rubidium are among those reported by Wells in 1893,[31] and inadvertantly omitted in my enumeration last year. Pyridine derivative periodides were obtained by Ramsay in England in 1878.[32] These were picoline periodides, the constitution of the picoline not being then established. This year, Wheeler and Walden publish[33] an account of several halogen addition products of the anilides, including a diiodide and a tetraiodide of acetanilide hydriodide, $(C_6H_5.NHCOCH_3)_2.HI.I_2$ and $(C_6H_5.NHCOCH_3)_2.HI.I_4$. A preliminary report[34] on these bodies was made in October 1895. In relation to this subject, reference should be made to the work of Arthur Hantzsch, in 1895,[35] upon halogen derivatives of hydrazins and diazo-compounds. The constitution of diazonium compounds is assumed.

Perhalides of Caffeine.

An extensive and important contribution on this subject has just been made by Dr. M. Gomberg,[36] and some considerable portions of this contribution here follow. Dr. Gomberg's previous papers on this subject[37] entitle him to confidence as a most trustworthy worker of good chemical judgment. From his last paper,[38] which fills 31 pages, I can take here only some of the portions most nearly related to the scope of this article. These selections here follow:

* * *

All the periodides of primary, secondary, and tertiary ammonium salts, including those of pyridine and its derivatives, contain hydriodic acid as the salt-forming acid, and the "periodine" is supposed to be linked to the iodine of this acid. The iodine of the acid, being linked directly to the nitrogen of the base, is not affected by reducing agents, such as sulphurous acid, sodium thiosulphate, nascent hydrogen, etc., while the "periodine" is readily attacked under such treatment, and yields hydriodic acid. The constitution of quaternary ammonium periodides, including those of the quaternary pyridine salts, is entirely similar to that of the tertiary class, the hydrogen of the acid being replaced by an alkyl. The following formulas will make this clear:

$R'''N<\begin{matrix}H\\I.I_n,\end{matrix}$ periodides of tertiary ammonium salts.

$R'''N<\begin{matrix}R\\I.I_n,\end{matrix}$ periodides of quaternary ammonium salts.

The organic bases are also capable of forming other halogen additive compounds, besides the simple periodides. These can be classified as follows:

1. Compounds wherein iodine or bromine is linked directly to the nitrogen without the intervention of a halogen acid, such as pyridine tetraiodide, $C_5H_5N.I_4$,[39] quinoline tetrabromide, $C_9H_7N.Br_4$.[40]

2. Those obtained by the action of monochloride[41] and trichloride[42] of iodine upon bases. They contain both chlorine and iodine linked directly to the nitrogen. Their structure can be represented by the general formula $R'''N<\begin{matrix}Cl\\I\end{matrix}$. These compounds still retain the power of forming salts by union with acids, as $(R'''NCl.I).HCl$.

3. Periodides wherein the "periodine" is linked to another halogen not iodine. These are few in number, and are all on the quaternary ammonium type, $R'''N<\begin{matrix}R\\Br.I_n.\end{matrix}$

4. Periodides containing another acid[43] in addition to hydriodic acid, such as in herapathites, periodo-selenites, phosphates, chlorides, etc. But as each contains hydriodic acid, Jörgensen legitimately infers that the "periodine" is in all probability linked to this acid and not to the other.

5. Perbromides of the hydrobromides of bases. Only very few of these have been reported, although it is well known that a great number of alkaloids are precipitated by bromine dissolved in hydrobromic acid. Pyridine,[44] quinoline[45] and nicotine[46] form such perbromides.

All the perhalides of organic bases, so far reported (except the simple periodides), can be referred to one of these five classes. And yet it can hardly be doubted that periodides and perbromides of other salts than hydriodides and hydrobromides respectively, are capable of existence. I have not been able to find any reports upon periodides in which either hydrochloric or hydrobromic acid has exactly the same function as hydriodic acid has in the simple periodides. Such derivatives can only be prepared when precautions are taken to strictly insure the absence of hydriodic acid during the preparation of the periodide, and this has never been the case in the methods that have hitherto been employed for that purpose. In the following pages will be found a description of such periodides of caffeine, which have been obtained by a method different from those that have been described. The compounds have all been prepared by substituting chloroform for alcohol as the medium of reaction, thus eliminating the action of iodine upon alcohol at higher temperatures, and the subsequent formation of hydriodic acid. Not only periodides, but perbromides of similar composition and constitution have been prepared by this method. The method is, indeed, of very general application for such purposes. Periodides of hydrobromides and hydrochlorides of the following bases have thus been obtained: Quinine, quinidine, cinchonine, cinchonidine, strychnine, brucine, atropine and quinoline (of the hydrobromide only).

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* Continued from p. 130.

[31] Wells and Wheeler, Am. Jour. Sci. [3], 44, p. 42. Wells and Penfield, Ibid., 43, p. 17.

[32] Phil. Mag. [5], 2, p. 269; 4, p. 241; 6, p. 19.

[33] Am. Chem. Jour., 18, p. 85.

[34] Ibid., 17, p. 612.

[35] Ber. d. chem. Ges., 28, p. 676, 1734.

[36] Instructor in Organic Chemistry in the University of Michigan.

[37] Trimethylxanthine and some of its Derivatives, 1892: Am. Chem. Jour., 14, pp. 611–619.—On the Action of some Inorganic Cyanides upon Chlorocaffeine, 1895: Am. Chem. Jour., 17, pp. 403—420.

[38] Perhalides of Caffeine, Jour. Am. Chem. Soc., 18, p. 347, April, 1896.

[39] Dafert, Monatsh. Chem., 4, p. 509; 1883; Prescott and Trowbridge: J. Am. Chem. Soc., 17, p. 865.

[40] Grimaux, 1882: Bull. Soc. Chim., 58, p. 124.

[41] Dittmar, 1885: Ber. d. chem. Ges., 18, p. 162.

[42] Pictel and Kraft: loc. cit., 72.

[43] Jörgenson, 1876: J. prakt. Chem. [2], 14, pp. 213, 356; 15, p. 65.

[44] Grimaux: Bull. Soc. Chim., 38, p. 127.

[45] Ber. d. chem. Ges., '9, p. 2766.

[46] Ann. Chem. (Liebig), 131, p. 260.

* * *

Periodides of Caffeine.

Caffeine Hydriodide Diiodide, $C_8H_{10}N_4O_2.HI.I_2$.—Tilden reported in 1865,[47] that when a solution of caffeine in dilute alcohol, containing some hydriodic acid, is exposed to sunlight, there appears in a few days a deposit of beautiful crystals, with a metallic greenish appearance, unstable, readily decomposing even at the water-bath heat. He assigned to the compound the formula $(C_8H_{10}N_4O_2.HI.I_2)_2.3H_2O$, and this agrees closely with the results of his analysis. In repeating the experiment, I find that under certain conditions a diiodide is formed, but the results of my analysis show no water of crystallization. Again, the diiodide is formed only when the formation of the crystals is tolerably rapid, as when the solution is kept in a warm place and exposed to direct light, conditions favoring oxidation of hydriodic acid. If, however, the liberation of iodine be very slow, yielding about a half gram of periodide in six or seven weeks, a tetraiodide is produced. The diiodide, obtained as above described, was filtered on a pump, washed with water containing some hydriodic acid, dried on porous plates and finally over sulphuric acid *in vacuo*. The samples were analyzed for total iodine and for the "periodine", or, as Tilden calls it, the "exterior" iodine. The first is estimated by suspending a weighed sample in water, treating with a solution of sulphur dioxide, then precipitating with silver nitrate and nitric acid. The "periodine" is estimated by titrating with a standard solution of sodium thiosulphate. The difference between the total and "exterior" iodine is that which corresponds to the hydriodic acid. Two independent samples thus prepared gave the following results:

	Calculated for $C_8H_{10}N_4O_2.HI.I_2$.	Found.	
		I.	II.
Total iodine	66.06	65.12	64.29
Periodine	44.04	44.04	44.18

The diiodide consists of long hexagonal prisms, with a metallic greenish luster. It decomposes readily when moist, but is quite stable when dry. When suspended in water the crystals lose their luster and become coated with a brown-red layer of the tetraiodide. It is soluble in warm alcohol with decomposition, insoluble in ether and chloroform. It melts at 171° C.

Caffeine Hydriodide Tetraiodide, $C_8H_{10}N_4O_2.HI.I_4$.—This is the periodide which caffeine usually forms when it forms any at all, except as above described. It is the most stable periodide of caffeine, and is formed under many different conditions, in both the amorphous and crystalline state. It has been obtained by the following methods:

1. When a solution of caffeine is treated with a solution of iodine in potassium iodide (Wagner's reagent), there is no visible reaction. On the addition of some mineral acid, a heavy amorphous dark-red precipitate is at once thrown down. The precipitation of caffeine in this way is quantitative, and forms the basis of a method for the estimation of caffeine.[48] The composition of this precipitate is, as I have fully described,[49] $C_8H_{10}N_4O_2.HI.I_4$. It was obtained for analysis in many different ways by varying the relative quantities of the reagents employed, but it has always proven to be of the same composition. The samples for analysis were obtained by filtering the amorphous precipitate on a pump, washing with water to remove the potassium salts, drying rapidly on porous plates, and finally *in vacuo* over sulphuric acid. The following are the results of analysis:

	Calculated for $C_8H_{10}N_4O_2.HI.I_4$.	Found.			
		I.	II.	III.	IV.
Total iodine	76.43	75.12	75.66	75.84	......
Periodine	61.15	60.79	60.11	60.81	60.76

2. When caffeine is dissolved in chloroform and is treated with a solution of iodine also in chloroform, no formation of any periodide should be noticed, even when the mixture is allowed to stand for weeks. If into this solution dry hydriodic acid gas be now passed, there is at once precipitated an amorphous dark-red periodide, identical in composition with that described under I. Upon analysis it gave the following figures:

	Percent.
Total iodine	75.14
Periodine	60.23

3. When a solution of caffeine in hydriodic acid is exposed to sunlight, but the liberation of iodine is hindered either by low temperature, or the presence of some reducing agents in the solution, then the crystals that are formed have the composition of the tetraiodide, and not that of diiodide. They also have a different appearance, being short prisms of a deep blue color. Several samples obtained in this way furnished the following figures:

	I.	II.	III.	IV.
Total iodine	......	......	......	75.11
Periodine	60.26	59.86	59.75	60.60

4. When either caffeine hydrobromide dibromide or tetrabromide is triturated with a solution of potassium iodide in water, there is again produced the same amorphous periodide. It gives upon analysis 59.90 percent of "exterior" iodine.

These four different methods show the great tendency of caffeine to form the higher periodide, which is apparently more stable than the diiodide. Weak base as it is, caffeine readily forms a higher periodide than is produced under similar conditions by many other organic bases.

Properties.—The periodide in the amorphous state and when dry, is of a dark blue-red color. It is quite stable when dry, and can be heated at 100° C. for many days without any appreciable loss of iodine. When moist it readily gives off iodine. Suspended in water, it gives up sufficient iodine to saturate the liquid, and after that remains unchanged. A solution of potassium iodide removes only a little more iodine than pure water alone. The periodide cannot be recrystallized from alcohol without considerable decomposition into caffeine and iodine. It is more soluble in methyl alcohol, and if not too much heat be used in dissolving it, the periodide can be obtained unchanged on spontaneous evaporation of the alcohol in the form of dark-blue needles. Ethyl acetate is, however, the best solvent for this periodide, as the latter dissolves in acetic ether without decomposition, even when heated. On cooling, the periodide separates in fine compact crystals. It is insoluble in chloroform, ether, benzene and carbon disulphide. It melts at 215° C.

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[47] J. Chem. Soc., 18, p. 99.

[48] J. Am. Chem. Soc., 18, p. 331.

[49] Loc. cit.

* * *

[Account is then given of the preparation and elementary analysis of the following mixed halides:]

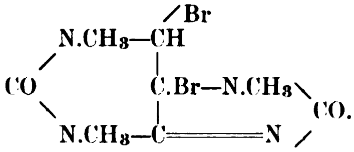
Caffeine Hydrobromide Tetraiodide, $C_8H_{10}N_4O_2.HBr.I_4$.

Caffeine Hydrochloride Diiodide, $C_8H_{10}N_4O_2.HCl.I_2$.

* * *

Perbromides of Caffeine.

The action of bromine upon caffeine has been the subject of investigation many times. When pure bromine is employed, in absence of water, the final action of bromine results in the formation of a substitution product, bromocaffeine, $C_8H_9BrN_4O_2$.[50] In presence of water the action of bromine upon caffeine is for the most part that of an oxidizing agent, as has been shown by Maly and Hinteregger.[51] But under whatever conditions bromine is added to a solution of caffeine or to the dry base, be it as bromine-water or pure bromine, there is at first thrown down an orange-red to a brick-red precipitate. According to Maly and Hinteregger's results of analysis it is a mere addition product, caffeine dibromide, and E. Fisher[52] expresses the same opinion. The constitution of the compound is presumably this:



I have subjected caffeine to the action of bromine under many varied conditions, but in no case have I been able to obtain this addition product. Indeed, as will be shown, its existence is entirely hypothetical. Although Maly and Hinteregger's results of analysis agree with the theoretical figures of the formula assigned by them to the compound, yet their method of obtaining and purifying the substance for analysis is such as to preclude the reliability of the results of analysis. The addition compound will be shown to have the composition $C_8H_{10}N_4O_2HBr.Br_4$, and not $C_8H_{10}N_4O_2.Br_5$. This perbromide losses a portion of its bromine quite readily; consequently, it must be analyzed, or at least protected from exposure, as soon as dry. Hence, Maly and Hinteregger's results, obtained upon samples which have been previously exposed over lime in a desiccator for several weeks, cannot furnish reliable data as to the composition of the original substance. Just as under the action of iodine in presence of hydriodic acid, caffeine exhibits a great tendency to form higher periodides, so under the action of bromine it always forms the tetrabromide of the hydrobromide. This takes place whether hydrobromic acid be added as such or not. When none is added, some hydrobromic acid is produced, either by the action of bromine upon water or by the direct action upon caffeine,

$$C_8H_{10}N_4O_2 + Br_2 = C_8H_9BrN_4O_2 + HBr.$$

It is only under special conditions that lower perbromides of caffeine are obtained.

Caffeine Hydrobromide Tetrabromide, $C_8H_{10}N_4O_2.HBr.Br_4$.—Whenever bromine is allowed to act upon caffeine, this perbromide is one of the first products of the reaction, if not the only one. It is produced in presence or in absence of hydrobromic acid, in presence of water, of chloroform, or when pure bromine is employed.

1. *In Presence of Water.*—When bromine-water is gradually added to a solution of caffeine acidulated with hydrobromic acid, there is produced a yellow amorphous precipitate, which becomes darker and more compact; also, if the addition of bromine be very gradual, the precipitate becomes crystalline. The same compound is however obtained easier, and more crystalline, by the following method of procedure: A stream of carbon dioxide is allowed to bubble through a column of pure bromine, and the fumes of the latter, greatly diluted with carbon dioxide, are carried into a solution of caffeine containing some hydrobromic acid. As the bromine first reaches the solution, the bubble of the gas becomes surrounded with a pale-yellow film, which soon grows darker, and the product finally settles to the bottom as an orange-red crystalline deposit, consisting of distinct small prisms. If the bromine fumes be passed into the solution too rapidly, the resulting product is amorphous. One gram of caffeine furnishes by this method two and three-tenths grams of the perbromide, which is about eighty percent of the theoretical value. The samples for analysis were filtered, by the use of a pump, washed with weak bromine-water, and dried by pressing on very porous plates. When dry, in about two hours, the upper layer of the mass is removed, and the rest is put away in small glass-stoppered bottles, where it remains unchanged for weeks. The washing and drying should not be prolonged any more than is necessary, as the compound loses bromine readily, especially when moist and exposed to open air. The samples were analyzed for the "exterior" bromine and for total bromine. The first was estimated by suspending a weighed quantity of the sample in a solution of potassium iodide, and the iodine thus liberated is titrated with a standard solution of sodium thiosulphate. The total bromine was estimated by precipitation with silver nitrate, in a manner entirely similar to that employed in the estimation of total iodine in the periodides. Several samples, prepared separately, gave the following results:

	Calculated for $C_8H_{10}N_4O_2.HBr.Br_4$.	Found. I.	II.	III.	IV.	V.	VI.
Total bromine:—	67.23	67.37	65.74	67.89	......	......	......
"Perbromine":—	53.78	54.00	52.07	54.04	54.18	53.11	52.58

The addition of hydrochloric acid or sulphuric acid, instead of the hydrobromic, does not give perbromides of salts of these acids, but the same perbromide of the hydrobromide of caffeine.

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[50] O. Schultzen: Ztschr. Chem., 1867, p. 614; E. Fisher: Ann. Chem. (Liebig), 215, p. 264.

[51] Monatsh. Chem., 3, p. 85, (1882).

[52] Ann. Chem. (Liebig), 215, p. 264.

The same product is obtained even if no acid whatever be added. Thus, when fumes of bromine, absolutely free from hydrobromic acid, are passed into a solution of caffeine, there appears after a short time a precipitate of exactly the same appearance and composition as the perbromide described above. The precipitation is much slower than when hydrobromic acid is present, nor is the yield so large. One gram of caffeine yields from two-tenths to three-tenths gram of the perbromide, which is only about eight to ten percent of the theoretical value. Samples for analysis, prepared as previously described, gave the following figures:

	I.	II.	III.
Total bromine..................	65.92	......	......
"Perbromine"....................	52.57	53.27	54.75

This is undoubtedly the same perbromide as obtained in presence of hydrobromic acid. The slow precipitation and the small yield point conclusively that a large portion of the caffeine suffers some other changes, namely, those of oxidation and substitution, either of which would give rise to hydrobromic acid. The acid thus produced would at once tend to form the perbromide of the hydrobromide of caffeine. Filtrates from such perbromides invariably give within a short time bulky precipitates of the white bromocaffeine, $C_8H_9BrN_4O_2$.

Great precautions were taken to insure the absence of hydrobromic acid in the bromine used. For this purpose the latter was washed with a solution of sodium hydroxide, then with sulphuric acid, and finally kept under a column of sulphuric acid saturated with silver sulphate. In some experiments the fumes were also passed through a second bottle containing sulphuric acid and silver sulphate. But the perbromide of the hydrobromide was always produced even under these conditions.

Properties.—The perbromide consists of small orange-red prismatic crystals. It melts sharply at 170° C. with previous decomposition into the dibromide, and finally decomposes completely. When suspended in water, it gives up some of its bromine and then gradually and slowly changes into the white bromocaffeine. Two grams of the perbromide change in this way completely in about one week. When spread out on plates and exposed to air for about twenty-four hours, it loses two atoms of bromine, leaving a more stable residue, the corresponding dibromide, which suffers very little loss of bromine on further exposure. The tetrabromide is quite soluble in alcohol, more so when warm, from which it separates, on cooling, in the form of a lower perbromide mixed with some pure caffeine. Methyl alcohol dissolves the tetrabromide very readily, with the production of large quantities of formic aldehyde, and almost complete reduction of the bromine. It dissolves in warm ethyl acetate, and this on evaporation furnishes yellow crystals of a lower perbromide. The perbromide is only slightly soluble in either hot or cold chloroform. Ether removes two atoms of bromine, leaving the yellow dibromide of caffeine hydrobromide. When heated, the tetrabromide loses a portion of its bromine, and finally changes into bromocaffeine, especially at a higher temperature, about 160°—170° C.

2. *Action of Bromine in the absence of Water.*—When a weak solution of bromine in chloroform is added to a solution of dry caffeine in the same solvent, there appears after some hours' standing a deposit of flaky crystals. With strong solutions of bromine the formation of crystals begins to take place at once, the amount constantly increasing. The mother-liquids, after filtering off the crystals, give new crops of the same compound. It was the compound thus produced that was analyzed by Maly and Hinteregger, after being allowed to stand several weeks over lime. The perbromide was filtered, washed with chloroform containing bromine, and dried on porous plates. It was found to be identical in composition with the one obtained similarly but with the previous addition of hydrobromic gas also dissolved in chloroform. The analyses I. and II. are upon samples obtained without the use of hydrobromic acid, while analyses III. and IV. are upon samples prepared with the addition of the acid.

	I.	II.	III.	IV.
Total bromine.......	68.25	......	......	......
Perbromine............	52.25	54.79	54.40	52.82

The perbromide thus obtained is entirely identical in its behavior towards different reagents and solvents with that obtained by the action of bromine upon caffeine in presence of water. It melts at 170° C.

The question may be asked, whence comes the hydrobromic acid that furnishes the hydrobromide of the base? The bromine used in all these experiments was carefully freed from any hydrobromic acid that might have been originally present. The chloroform also was dehydrated for several days over fused calcium chloride, and finally carefully distilled. Blank experiments with absolutely dry chloroform (distilled over phosphorous pentoxide) have established that there is practically no absorption of bromine by the chloroform, when a three percent solution of the halogen in that liquid is exposed to light for several days. Therefore, the hydrobromic acid in the reaction could not have been produced from the substituting action of bromine upon chloroform, a reaction which takes place only at higher temperatures. From the rapid formation of the perbromide when strong solutions of bromine are used, it may reasonably be assumed that at least a portion of the hydrobromic acid, if not all of it, must have been produced directly as one of the products of the substituting action of bromine upon caffeine itself, thus:

$$C_8H_{10}N_4O_2 + Br_2 = C_8H_9BrN_4O_2 + HBr.$$

Additional proof to this theory is lent by the fact that by fractional precipitation, products are eventually obtained which give somewhat higher results for total bromine, while the "perbromine" is about the same. This would point towards the formation of $C_8H_9BrN_4O_2.HBr.Br_5$, a compound, the description of which will be given further on. The last crops of crystals show also a lower melting point, 150°—156° C.; and when the crystals are suspended in water and treated with sulphurous acid, they yield besides caffeine an insoluble precipitate of the white bromocaffeine.

3. *Action of Pure Bromine.*—When dry caffeine is slowly added to pure bromine the first portions go into solution, but further addition produces a dark-red insoluble mass, which was supposed by Maly and Hinteregger, and by E. Fisher, to be the caffeine dibromide, $C_8H_{10}N_4O_2.Br_2$. It is, however, not that, but the same tetrabromide of caffeine hydrobromide just described, mixed with a similar perbromide of bromocaffeine.

Dry caffeine was slowly added to a large excess of bromine free from hydrobromic acid, and the mixture was allowed to stand six hours. The thick dark mass was then spread out on porous plates, and allowed to remain over lime for three days. It was then divided into three portions: (*a*) was analyzed at once, (*b*) was washed with chloroform, and (*c*) was again redigested in pure bromine. The results of analysis are as follows:

	a.	*b.*	*c.*
Total bromine	69.45	68.50	68.03
Perbromine	53.88	54.60	53.07

On treatment with reducing agents there is left a slight residue of the insoluble bromocaffeine, and its formation would readily account for the high results of total bromine. The reaction then in this case is the same as when chloroform is employed. A small portion of the caffeine is at once attacked by the bromine and forms bromocaffeine and hydrobromic acid. The acid at once unites with the unchanged caffeine and forms the insoluble perbromide, thus protecting it against further direct action of bromine; then the bromocaffeine is in its turn slowly changed into a similar perbromide.

So far, then, as experimental evidence goes, the caffeine dibromide, $C_8H_{10}N_4O_2.Br_2$, is entirely hypothetical. It may still be said that the evidence does not exclude the possibility that only two atoms of bromine go to form the perbromide, while the other two atoms are retained by caffeine through the unsaturated linking between the two carbon atoms. Against this view there stands the simple fact that iodine, even in dilute solutions in water, forms the analogous tetraiodide. It is hardly probable that iodine would attach itself so readily to carbon. Then again, no assimilation of either bromine or iodine by caffeine takes place unless some acid be present. Hence, the constitution of this perbromide must be analogous to that of the periodide, i. e., it is a pure and simple caffeine hydrobromide tetrabromide.

Caffeine Hydrobromide Dibromide, $C_8H_{10}N_4O_2.HBr.Br_2$.—When the tetrabromide is exposed to air it loses bromine, and after twenty-four to forty hours there is left a yellow amorphous powder, which is tolerably stable and can be further exposed for many days without any appreciable loss of bromine. The results of analysis show this to be caffeine hydrobromide dibromide. The same compound is obtained by treating the tetrabromide with anhydrous ether. Samples of the tetrabromide were finely powdered under ether, and the digestion with ether was continued until fresh portions of the solvent showed no coloration when added to the perbromide. The yellow residue was filtered, washed with ether, and dried by exposure. It is identical in composition and properties with that obtained by simple exposure of the tetrabromide. Analyses I., II., and III. are upon samples obtained by exposing the tetrabromide to air. Analyses IV. and V. are upon samples obtained by treatment with ether.

	Calculated for $C_8H_{10}N_4O_2.HBr.Br_2$.	Found. I.	II.	III.	IV.	V.
Total bromine:—	55.17	......	53.45	......	54.99	......
Perbromine:—	36.78	36.48	35.50	35.93	36.87	35.83

The dibromide ranges in color from pale-yellow to a decided yellow. It is amorphous, and melts at 170° C. When suspended in water it turns orange-red, and, as analysis shows, is changed into the tetrabromide. It is soluble in ethyl alcohol with less decomposition than the higher perbromide. On cooling the alcohol it separates in distinct tetrahedral crystals, containing less bromine than the original compound (total = 42.50 percent, and "exterior" bromine 27.8 percent). Methyl alcohol dissolves the dibromide even more readily than ethyl alcohol, also with less decomposition than it does the higher perbromide. It is slightly soluble in ethyl acetate, insoluble in chloroform and ether. It remains tolerably permanent when heated to 100° C., but, on prolonged heating, or at higher temperature, it is rapidly converted into bromocaffeine.

* * *

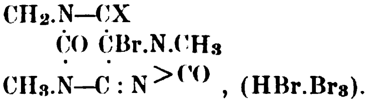
[The author has obtained, further:]

Caffeine Hydrochloride Tetrabromide, $C_8H_{10}N_4O_2.HCl.Br_4$.
Chlorocaffeine Hydriodide, $C_8H_9ClN_4O_2.HI$.
Chlorocaffeine Hydrobromide, $C_8H_9ClN_4O_2.HBr$.
Chlorocaffeine Hydrochloride, $C_8H_9ClN_4O_2.HCl$.
Chlorocaffeine Hydriodide Pentiodide, $C_8H_9ClN_4O_2.HI.I_5$.
Chlorocaffeine Hydrobromide Pentiodide, $C_8H_9ClN_4O_2.HBr.I_5$.
Chlorocaffeine Hydrochloride Tetraiodide, $C_8H_9ClN_4O_2.HCl.I_4$.
Chlorocaffeine Hydrobromide Monobromide, $C_8H_9ClN_4O_2.HBr.Br$.
Chlorocaffeine Hydrochloride Pentabromide, $C_8H_9ClN_4O_2.HCl.Br_5$.
Bromocaffeine[53] Hydriodide, $C_8H_9BrN_4O_2.HI$.
Bromocaffeine Hydrobromide, $C_8H_9BrN_4O_2.HBr$.
Bromocaffeine Hydrochloride, $C_8H_9BrN_4O_2.HCl$.
Bromocaffeine Hydriodide Pentiodide, $C_8H_9BrN_4O_2.HI.I_5$.
Bromocaffeine Hydrobromide Pentiodide, $C_8H_9BrN_4O_2.HBr.I_5$.
Bromocaffeine Hydrochloride Tetraiodide, $C_8H_9BrN_4O_2.HCl.I_4$.
Bromocaffeine Hydrobromide Pentabromide, $C_8H_9BrN_4O_2.HBr.Br_5$.
Bromocaffeine Hydrobromide Monobromide, $C_8H_9BrN_4O_2.HBr.Br$.
Bromocaffeine Hydrochloride Pentabromide, $C_8H_9BrN_4O_2.HCl.Br_5$.

* * *

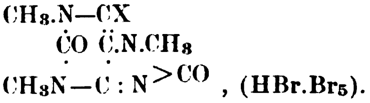
It may be said, that whatever the case be with pure caffeine itself, the perbromides of the halogen substitution derivatives of the base may after all have two bromine atoms linked to the unsaturated carbon atoms, and only the three remaining bromine atoms form the true perbromide. That is, the constitution of the perbromides should be represented by Formula I., and not by II.

I.



$$\begin{array}{l} \qquad\quad\ \mathrm{Br} \\ \mathrm{CH_2.N{-}CX} \\ \qquad \dot{\mathrm{C}}\mathrm{O}\ \dot{\mathrm{C}}\mathrm{Br.N.CH_3} \\ \mathrm{CH_3.\dot{N}{-}\dot{C}:N}{>}\mathrm{CO},\ (\mathrm{HBr.Br_3}). \end{array}$$

II.



$$\begin{array}{l} \mathrm{CH_3.N{-}CX} \\ \qquad \dot{\mathrm{C}}\mathrm{O}\ \ddot{\mathrm{C}}\mathrm{.N.CH_3} \\ \mathrm{CH_3\dot{N}{-}\dot{C}:N}{>}\mathrm{CO},\ (\mathrm{HBr.Br_5}). \end{array}$$

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[53] Ann. Chem. (Liebig), 215, p. 272.

In favor of this view, we have the fact that the introduction of a negative group (X) into the caffeine molecule favors the formation of such additive products. Thus, E. Fisher[54] has found that hydroxycaffeine readily unites with bromine, and the resulting additive product has not unlikely this composition: $C_8H_9(OH)N_4O_2.Br_2$. But against this view we have (1) that no such dibromo-additive compounds of either chloro- or bromocaffeine have ever been isolated; (2) that even iodine makes the penta-perhalides, and not the tri-perhalides, as we should otherwise expect, and (3) that the formation of the perhalides of bromo and chlorocaffeine takes place only in presence of some halogen acid.

* * *

(To be continued.)

Pellotine, a New Hypnotic.

By Dr. *A. Heffter*, Docent on Pharmacology at the University of Leipzig.

Under the name of pellote one or several species of cacti are used as a narcotic beverage by the Indians of northern Mexico in the states of Cohahuila and Tamaulipas. Like the cocaleaf in South America, pellote is chewed during races and fatiguing marches. Persons partaking of it are supposed to be able to endure hunger and thirst longer than without it. Medicinally it is used externally as a cataplasm; internally in the form of an infusion against fever. The drug was official in the Mexican Pharmacopœia in 1842. The use of it is also connected with religious rites.

The drug known popularly as pellote seems to be derived from two species of *Anhalonium: Anhalonium Williamsi* (*Echinocactus Williamsi* Lem.) and *Anhalonium Lewinii*. Both species resemble each other externally to such an extent that some connoisseurs regard the latter merely as a variety of the former. The chemical examination, however, has revealed decided differences between these two species of *Anhalonium*. As far as pellotine is concerned *Anhalonium Williamsi* alone comes into consideration. This cactus, which is fairly common on the Mexican plateau, is grayish-green, clubshaped and without spines. The small flower is reddish-violet. Its gently rounded ribs bear areoles covered with woolly hairs.

The diameter of this insignificant plant is 1.5 to 6.0 cm. by 5 to 9 cm.

The juice of the cactus, which is very rich in water, has an intensely bitter taste. The alkaloid pellotine, which is present to the extent of 0.75 to 0.89 percent, can readily be obtained in the following manner:—

The sliced cactus is repeatedly extracted with dilute, ammoniacal alcohol at a temperature of from 40 to 50° C. The yellowish-green extract is distilled until a residue of syrup consistency, which is acid, remains. Water is added and the solution is evaporated to remove traces of the alcohol. Considerable resin, which is insoluble in both acids and alkali, separates. This is removed by filtration. The clear brown-colored filtrate is made alkaline with ammonia and repeatedly shaken with large quantities of ether. The ether is recovered by distillation. The residue, though without a specific odor, possesses a strong alkaline reaction.

The attempt to purify the pellotine through the sulphate was unsuccessful. If the alkaline syrupy residue is diluted with 96 p. c. alcohol and set aside in a desiccator, a considerable quantity of crystals separates within 12 to 24 hours. These are purified by recrystallization from alcohol and lastly from petroleum ether.

Pellotine is a tertiary base, the composition of which is expressed by the formula $C_{13}H_{19}NO_3$. It crystallizes from alcohol in colorless plates, which melt at 110—111°, possess a bitter taste, are difficultly soluble in water, readily in alcohol, ether, acetone and chloroform. As has been demonstrated* pellotine contains two methoxy groups (OCH_3), whereas the third oxygen atom is present in the form of a hydroxy group, the hydrogen of which can be replaced by methyl, benzoyl etc. radicles.

With acids, pellotine combines to form readily crystallizable salts. Of these the hydrochloride can most readily be obtained in a pure form and is therefore best adapted to therapeutic experiments. It crystallizes in colorless prisms, which are readily soluble even in cold water. Alcohol dissolves only traces. From the dilute aqueous solution ammonia gradually precipitates the free base, whereas potassa and soda do not.

In regard to the action of pellotine, our experimental knowledge up to the present time is summed up in the following.

When frogs are injected with 8 to 10 mgr. of the alkaloid, a light narcosis sets in after ten or fifteen minutes. The reflexes are somewhat diminished and a stronger stimulus is required to arouse the animal to the point of making a spring. When laid on its back the animal easily endures the position. This condition lasts 20 to 30 minutes. Then a plain increase of the reflex irritability is to be seen, showing itself, when the animal jumps, in the striking manner in which the legs are thrown and in the abnormally great distance covered at a spring. Soon tetanic convulsions set in which after a time appear without any noticeable external cause and remind one distinctly of strychnine tetanus. When larger doses are used, the tetanic condition is followed more or less quickly by a complete paralysis. The irritability of the motor nerves is reduced only after long-continued convulsions. Very large doses of pellotine which suffice to very quickly bring on paralysis, influence neither the peripheral motor nerves nor the striped muscles. The tetanic attacks appear also in frogs after the destruction of the brain; pellotine causes, therefore, not an irritation of the spasm-center but a hightening of the reflex irritability of the spinal cord.

In rabbits, 0.05 to 0.07 grm. pellotine per kilo brings on a short period of narcosis in which the animal lies on its belly with outstretched extremities and sunken head. It easily wakens from this somnolent condition on being touched but quickly falls back into it again. Respiration is hardly affected, at the most a little slowed. After about half an hour is seen an increase in reflex irritability, a trembling of the head and the animal is easily startled. An external stimulation, a series of tetanic attacks, trismus and opisthotonus, occurs. In larger doses, the animal succumbs during one of these spasms.

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[54] Ann. Chem. (Liebig), 215, p. 272.

* For further information concerning preparation, chemical properties etc., consult the following articles:—"Ueber Pellote" (with an illustration of the drug), Arch. f. exp. Path. & Pharm. 34, p. 65.
Ueber zwei Cacteenalkaloide. Ber. d. d. chem. Ges. 27, p. 2975.
Ueber Cacteenalkaloide. 2. Mittheilung. Ebenda, 29. p. 216.

As regards the action of pellotine on the circulatory apparatus, the frog's heart is not essentially influenced. In the rabbit, at the beginning of the poisoning, a slight slowing of the pulse is to be noticed which quickly disappears. The blood pressure remains essentially unchanged. Only very large doses cause a depression, perhaps a result of the relaxation of the vessels due to the paralysis of the vaso-motor center. This point can be investigated only in animals by the use of artificial respiration since, otherwise, before the relaxation of the vessels occurs, death takes place as a result of the failure of respiration.

The elimination of pellotine seems to take place through the kidneys. At least in one experiment an alkaloid obtained in very small quantity from the urine, gave the reaction of pellotine.

Experiments on healthy human beings have finally shown that doses from 0.05 to 0.06 grm. possess a noticeable narcotic action. About two hours after taking into the stomach, the persons experimented on felt a pronounced sense of weariness, heaviness of the limbs and eyelids and a disinclination to physical and mental exertion. The pulse beat was in all cases diminished in frequency. After about an hour, the effect had passed off, neither headache nor feeling of illness having resulted.

From the above it appears that the point attacked by pellotine is the nervous central organ. Poisoning caused by pellotine shows two stages: one, narcotic, as a result of the paralysis of the brain and a tetanic stage following, due to the abnormally heightened irritability of the spinal cord. Accordingly pellotine would fall into the pharmacological group with morphine.

As regards the therapeutic application, Prof. Jolly of the Charité in Berlin has made clinical experiments from which it appears that pellotine in doses of 0.04 grm. does good service as a narcotic and that it may take rank with morphine among medical resources.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.Continued.

Nachtrag zu **Neea theifera** Oersted. Endlich ist es mir gelungen, durch die Güte des Arztes und Pflanzers Dr. Pereira Lima, aus dem Camposgebiete des Staates Minas (do Sul), Blüthenexemplare und eine Portion frische Blätter und Zweige zu erlangen.

Um das darin seinsollende Caffein zu bestimmen, wurden die verschiedenen, in den neueren Werken publicirten Methoden, ausgeführt; doch war es mir nicht möglich, auch nur Spuren des Caffeins zu finden. Ich erhielt mehrfach Krystalle, welche gereinigt sich als anorganisch erwiesen und zum grössten Theile aus Chlorkalium bestanden.

In 1000 Gramm frischer Blätter und frischer dünner Zweige wurden gefunden:

	Blätter.	Zweige.
Wasser	684,782 G.	700,000 G.
Wachsartige Substanz	3,658 "	0,075 "
Fett	5,610 "	——
Weichharz	3,000 "	0,454 "
Harzsäure	8,666 "	7,047 "
Gerbsäure (?)	1,000 "	——
Chlorkalium Krystalle	2,666 "	0,200 "
Extract etc	62,117 "	31,254 "
Asche	43,480 "	50,000 "

Das Fett ist orangebräunlich, geruch- und geschmacklos. Schwefelsäure schwärzt dasselbe, während rauchende Salpetersäure dasselbe entfärbt und damit eine weissgelbliche, weiche Masse bildet. Die Harze sind sämmtlich geruch- und geschmacklos. Die Gerbsäure bildet getrocknet und gepulvert ein gelbbräunliches Pulver von stark styptischem Geschmack, ist in Alcohol und Wasser leicht löslich. Mit Eisenchlorid giebt die Lösung eine schwarze, mit Kaliumchromat eine schwarzbraune Färbung;

Additional on **Neea theifera** Oersted. Through the kindness of the physician and planter, Dr. Pereira Lima, I have finally succeeded in obtaining from the Campos region of the state of Minas (do Sul) flowering specimens as well as leaves and twigs of this plant.

For the determination of the caffeine presumably present, the different methods published in the newer works were used; still I was able to detect only traces of caffeine. I frequently obtained crystals which when purified were found to be inorganic and to be composed in great part of potassium chloride.

In 1000 grams of fresh leaves and the same weight of small twigs was found:

	Leaves.	Twigs.
Water	684,782 g.	700,000 g.
Waxlike body	3,658 "	0,075 "
Fat	5,610 "	——
Soft resin	3,000 "	0,454 "
Resin acid	8,666 "	7,047 "
Tannic acid (?)	1,000 "	——
Potassium chloride crystals	2,666 "	0,200 "
Extract, etc	62,117 "	31,254 "
Ash	43,480 "	50,000 "

The fat is brownish-orange, odorless and tasteless. Sulphuric acid gives it a black color, while fuming nitric acid decolorizes it, leaving a soft, yellowish-white mass. The resins are all odorless and tasteless. The tannic acid when dried and pulverized forms a yellowish-brown powder of strongly styptic taste, readily soluble in alcohol and water. With iron chloride the solution gives a black color; with potassium chromate a blackish-brown color; with baryta a turbidity followed by

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* Continued from p. 51. Translated for the Review by Dr. R. H. True, instructor in Pharmacognosy at the University of Wisconsin.

mit Baryt eine Trübung, dann gelatinirend; mit Kalkwasser keine Trübung, wird aber dickflüssig; mit Cinchoninsulfat und Kupferacetat starke Niederschläge; mit Leimlösung Trübung, doch kein käseartiges Präcipitat; mit Brechweinstein keine Reaction.

gelatinization; with lime water no turbidity, becoming, however, thick-fluid; with cinchonine sulphate and copper acetate bulky precipitates; with glue solution a turbidity but no cheese-like precipitate; with tartar emetic no reaction.

Hernandiaceæ.

Hernandia guyanensis Aubl. In den Staaten Para und Amazonas, wird *Paó rosa* — Rosenholz — benannt. Ein 20 Meter hoher Baum mit dichter Krone. Blätter glatt, länglich-oval, an der Basis abgerundet. Blüthenstand schirmtraubenartig mit monœcischen Blüthen. Frucht eiförmig, gerippt und roth gefleckt.

Der Stamm hat ein weisses, schwammiges Holz, welches den Indianern zum Anzünden des Feuers dient. Der Splint ist fest, rosaroth, von Sellerieähnlichem Geruch. Geraspelt, mit Zuckerbranntwein digerirt, hat dasselbe Ruf als Aphrodisiacum. Das Decoct der Rinde, innerlich und äusserlich angewandt, soll als Antidot bei Verwundung mit vergifteten Pfeilen hülfreich sein.

Die ölreichen Früchte dienen als Abführmittel: drei Früchte mit Honig der Waldbiene *Mandasaia*, zur Masse angestossen, auf einmal genommen.

Hernandia guyanensis Aubl. In the states Para and Amazonas is called *Paó rosa*, rosewood. A tree 20 meters in height with dense crown; leaves smooth, oblong-oval, rounded at the base; inflorescence an umbrella-shaped raceme with monœcious flowers; fruit ovate, ribbed and spotted with red.

The stem has a white, spongy wood which the Indians use in kindling a fire. The sap wood is firm, rose-red, with a celery-like odor. When rasped and digested with sugar brandy it is reported to act as an aphrodisiac. The decoction of the bark, internally and externally used, is said to be useful as an antidote in case of wounds from poisoned arrows.

The oily fruits are purgative in action; three fruits ground to a mass in the honey of the forest bees, *Mandasaia*, are taken as a dose.

Berberidaceæ.

Berberis laurina Billb. Vom Staate Minas bis Rio Grande do Sul, heisst *Uva de espinha*, Stacheltraube. Strauch von 1 bis 2 Meter Höhe, besetzt mit dreitheiligen, scharfen Dornen, Blätter in Büscheln bis zu 12, lederig, umgekehrt lancettlich oder verkehrt eirund länglich, ganzrandig und stachelspitzig. Blüthenstand in schlanken herabhängenden Trauben mit dunkelgelben Blüthen. Beere graublau bereift, 9 mm. lang. Die adstringirend schmeckenden Früchte werden als Antiscorbuticum benutzt, das Decoct der Blätter bei Hals- und Mundaffectionen. Das Decoct der Rinde ist ein Volksmittel bei Wechselfieber.

Berberis laurina Billb. From the state of Minas to Rio Grande do Sul; is called *Uva de espinha*, prickly grape. A shrub from 1 to 2 meters in height, beset with three-parted, sharp thorns; leaves in groups of as many as 12, leathern, oblanceolate or oboval-lanceolate, margin entire, ending apiculately; inflorescence in slender, pendant racemes with dark yellow flowers; berries grayish-blue, pruinose, 9 mm. long. The astringent tasting fruits are antiscorbutic. The decoction of the leaves is used in affections of the neck and mouth; that of the bark is a popular remedy against intermittent fever.

Portulacaceæ.

Talinum patens Willd. Kommt vor in allen Staaten Brasiliens. Ist bekannt als *Ora pro nobis miudo* — kleines Paternosterkraut, und als *Beldrœga miuda* — kleiner Portulak.

Eine Pflanze mit aufrechten, an der Basis halbstrauchartigen, wenig ästigen Stengeln. Blätter klein, dickfleischig, glatt, verkehrt eirund oder ovallancettlich. Blüthenstand in endständiger Rispe mit rothen oder gelben Blumen. Frucht eine runde, dreiklappige Kapsel.

Die Blätter werden als Gemüse genossen, selten als Salat. Als Volksmittel dient es zur Heilung von *fluor albus*. Vom ausgepressten Saft der frischen Blätter, mit gleichen Theilen Wasser gemischt, wird dreimal täglich ein Kelchglasvoll genommen. Eine Handvoll dieser Blätter und eine gleiche Quantität *fol. plantagin. Guilleminianæ* (Tauchagem) zu einer Flasche Decoct bereitet dient als Einspritzung.

Sehr geringe Benutzung findet die in den Nordstaaten mit demselben Volksnamen bekannte *Talinum ramosissimum* Rohrb., welche ebenfalls als Gemüse, sowie als ein hællendes Getränk benutzt wird. Die Samen mit Wein macerirt, sollen als Emmenagogum wirksam sein.

Talinum patens Willd. Is found in all the states of Brazil and is known as *Ora pro nobis miudo* — small paternoster plant, and as *Beldrœga miuda* — small portulaca.

A plant with upright, sparingly branching stem, half-shrubby at the base; leaves small, thick and fleshy, smooth, inversely oval or oval-lanceolate; inflorescence a terminal panicle with red or yellow flowers; fruit a round, three-valved capsule.

The leaves are used as greens, seldom as a salad. It is a popular remedy for *fluor albus*. The juice expressed from the fresh leaves is mixed with an equal part of water and a wineglassful is taken three times a day. From a handful of these leaves and a like quantity of *fol. plantagin. Guilleminianæ* (Tauchagem) a bottleful (Flasche) of decoction is prepared which is used as an injection.

Talinum ramosissimum Rohrb., known by the same popular name, finds a very limited use in the northern states, where it is used as a pot-herb and as a clarifying beverage. The seeds macerated with wine are said to be effective as an emmenagogue.

Portulaca oleracea Linn. Wahrscheinlich durch Zufall von Portugal schon im 16. Jahrh. eingewandert, hat sich diese Pflanze in allen Staa-

Portulaca oleracea Linn. Probably introduced accidentally as early as the 16th century from Portugal, this plant has spread throughout ten als Unkraut verbreitet, doch wird dieselbe nie kultivirt. Sie ist bekannt als *Baldrœga* oder *Beldrœga*, in den Nordstaaten als *Caa-ponga*. Die häufigste Benutzung findet diese Pflanze als Gemüse. Sie ist sehr beliebt als Salat, besonders wenn derselbe statt mit Essig mit Limonensaft bereitet ist.

Portulaca mucronata Link. Ist vom Aequator bis zum 25° südlicher Breite verbreitet. Im Staate Pará heisst dieselbe *Càruru*—Gemüseblatt; in Maranhon *Benzãs de Deos*—Gottessegen, sowie *Bredo maior*—grosser Amarant; in den Nordstaaten *Lingua de vacia*—Ochsenzunge; in S. Paulo, Minas und Rio de Janeiro *Maria Gomes und João Gomes*.

Der aufrechte, etwas holzige, nur an der Basis ästige Stengel hat lancettlich-spatelförmige, spitze Blätter. Der Blüthenstand ist endständig mit 2 bis 3 gelben Blüthen. Die Frucht ist eine verkehrt eiförmige Kapsel mit zahlreichen, nierenförmigen, schwarz metallisch-glänzenden Samen.

Das Decoct dient als kühlendes, erweichendes Getränk bei fieberhaften Affectionen; die Blätter als Gemüse und Salat wie die Vorhergehenden. Zum Salat werden jedoch nur die jungen Blätter gebraucht.

Portulaca grandiflora Hook. In den Staaten Pará, Amazonas, Matto Grosso, St. Paulo und Minas; in den drei ersteren als *Perexi* und *Perrexi*, in den letzteren als *Amor crescido* bekannt.

Die wilde Pflanze hat zahlreiche, holzige Stengel mit fleischigen, schmal-linearischen, spitzen oder stumpfen Blättern, in den Achseln derselben mit langen, weissen Haaren bekleidet. Die Blüthen sind gelb, dicht gedrängt an den Spitzen der Aeste, die Kapseln und Samen ähnlich den Vorhergehenden.

Die schleimreichen Blätter dienen innerlich als gelindes Diureticum, äusserlich als Umschlag bei entzündeten Hautaffectionen. Auch wird die Pflanze allgemein als Zierpflanze in den Gärten verwendet, doch vorzugsweise die Farbenvarietäten, deren Samen aus Europa importirt werden.

Portulaca pilosa Linn. Kommt vor in allen Staaten bis zum 36° südlicher Breite. Im Staate Pará ist derselbe ebenfalls als *Parrexi* bekannt; in Alagôas als *Alecrim de S. Jose;* in den anderen Nordstaaten als *Càa-ponga* und in den Südstaaten als *Amor crescido.*

Mit zahlreichen niederliegenden Aesten, Blättern und Blattachselhaaren, ähnlich den vorigen. Blüthenstand endständig mit 2 bis 3 gelben oder purpurrothen Blüthen. Kapsel verkehrt eirund, fast kugelig, mit schwarzbraunen, mattglänzenden Samen.

Wird nicht zur Speise benutzt. Die Blätter schmecken bitter. Jedoch wird die Pflanze als Tonicum und Diureticum geschätzt. Sie findet vielfache Benutzung als Volksmittel bei Erysipelas. Der ausgepresste Saft dient als Umschlag. Auch dient sie als Zierpflanze in den Gärten.

all the states as a weed. It is never cultivated. It is known as *Baldrœga* or *Beldrœga*, in the northern states as *Caa-ponga*. It is highly esteemed as a salad, especially when prepared with lemon juice instead of vinegar. It finds most frequent use, however, as a pot-herb.

Portulaca mucronata Link. Is distributed from the equator to 25° S. Lat. In the state Pará it is called *Càruru*—pot-herb leaf; in Maranhan *Benzãs de Deos*—God's blessing, as well as *Bredo maior*—large amaranth; in the northern states *Lingua de vacia*—ox tongue; in S. Paulo, Minas and Rio de Janeiro *Maria Gomes* and *João Gomes*.

The upright, somewhat woody stem branching only at the base, has lanceolate-spatulate, pointed leaves; the inflorescence is terminal with two or three yellow flowers; the fruit is an obovate capsule with numerous, kidney-shaped seeds, black in color with a metallic lustre.

The decoction affords a cooling, emollient drink in fever-like affections; it is also, like the foregoing species, used as a pot-herb and salad.

Portulaca grandiflora Hook. In the states Pará, Amazonas, Matto Grosso, S. Paulo and Minas; is known in the first three states as *Perexi* and *Perrexi;* in the remaining states as *Amor crescido.*

The wild plant has numerous woody stems with fleshy, narrowly-linear, acute or blunt leaves, in the axils of which are situated long, white hairs; the yellow flowers are closely crowded at the ends of the branches; the capsules and seeds resemble those of the foregoing.

The leaves, rich in mucilage, are taken internally as a mild diuretic and are used externally as an application in inflamed skin affections. The plant is also commonly cultivated in gardens for ornamental purposes. Usually, however, colored varieties raised from seed imported from Europe are found.

Portulaca pilosa Linn. Is found in all states as far south as 36° S. Lat. In the state Pará, it is likewise called *Parrexi;* in Alagôas *Alecrim de S. Jose;* in the other northern states *Càa-ponga*, and in the southern states *Amor crescido.*

With numerous decumbent branches, leaves and axillary hairs as in the foregoing; inflorescence terminal with two or three yellow or purple-red flowers; capsule inverted oval, almost spherical with blackish-brown, dull-shining seeds.

Not used as a food since the leaves have a bitter taste. The plant is esteemed as a tonic and diuretic and is frequently employed as a popular remedy for erysipelas. The expressed juice is used as an application. The plant is also used for ornamental purposes in gardens.

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Strontium Salicylate.

By *Ferd. A. Sieker.*

A number of strontium salts have in recent years found application in medicine, and three of them, the iodid, bromid and lactate are recognized by the United States Pharmacopœia of 1890. Since then a demand for the salicylate arose.

Although the salicylate of barium and calcium were described a long time ago[1] and the magnesium salt was described by Milone[2] in 1886, the strontium salt appears to have been first prepared in 1894 by Mr. F. W. Haussmann[3]. In his experiments he prepared it by double decomposition as well as by saturation.

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[1] Picra, Annalen der Chemie, Vol. 93, p. 262.

[2] Fischer, Die Neueren Arzneimittel, 4th edition, p. 20.

[3] Proceeding American Pharm. Ass'n. 1894, Vol. 42, p. 1070.

I have found saturation satisfactory; the precautions necessary are the selection of a pure carbonate (free from barium) and avoiding contact with iron and overheating.

The purity of the carbonate may be determined by titration with volumetric acid and a special test for barium should be applied as follows:

1 gm. of carbonate if exactly neutralized with acetic or hydrochloric acid, and diluted with water to 10 cc. should not be rendered turbid after the addition of a few drops of potassium dichromate, T. S.

To prepare strontium salicylate, mix 276 parts of salicylic acid with 3500 parts of distilled water and almost neutralize with strontium carbonate for which purpose about 148 parts are necessary. In working on a small scale a porcelain dish is used, and a temperature of about 80° C. is necessary. The hot, slightly acid solution is rapidly filtered and evaporated to about ⅓ of its volume and set aside to crystallize. The mother liquor is concentrated by evaporation and another crop of crystals are obtained, etc. The crystals are washed with cold distilled water and dried at the ordinary temperature, or at a temperature of about 50° C. The crystals thus obtained possess a pinkish shade, but form a pure white powder. The reaction of the salt if crystallized from a slightly acid solution, is feebly acid toward sensitive litmus paper but on recrystallization a neutral salt can be obtained.

The composition of strontium salicylate does not appear to have been recorded. According to the references cited above, the composition of the calcium, barium and magnesium salts are respectively as follows:

$$\left\{C_6H_4<\begin{matrix}OH\\CO.O\end{matrix}\right\}_2Ca+2H_2O;$$

$$\left\{C_6H_4<\begin{matrix}OH\\CO.O\end{matrix}\right\}_2Ba+H_2O; \text{ and}$$

$$\left\{C_6H_4<\begin{matrix}OH\\CO.O\end{matrix}\right\}_2Mg+4H_2O.$$

In order to determine the composition of the strontium salt, a small quantity prepared as above was recrystallized, so as to obtain a neutral salt; 0.8235 gm. dissolved in hot water was titrated at the boiling temperature with $\frac{N}{2}Na_2CO_3$, using phenolphtalein as indicator. Required 8.2 cc. (2 estimations), which is equivalent to 21.73% Sr. This conforms quite closely to the formula:

$$\left\{C_6H_4<\begin{matrix}OH\\CO.O\end{matrix}\right\}_2Sr+2H_2O=396.56,$$

which requires 22.01% of Sr., while a salt with one molecule of water would require 23.05% and a salt with three molecules of water of crystallization, 21.06% of Sr.

Strontium salicylate requires about 18 parts of water for solution at 20° C., but is very much more soluble in boiling water. It is sparingly soluble in cold alcohol.

An aqueous solution (1:20) prepared with the aid of a gentle heat should be colorless, or at most possess a pinkish tinge. Such a solution should be clear and free from insoluble matter. It should be neutral or only feebly acid toward sensitive litmus. The salt responds to the usual tests for strontium and salicylic acid.

If 1 gm. of the salt be ignited in a crucible and the residue dissolved in a slight excess of acetic acid diluted with water to 10 cc., filtered and a few drops of potassium dichromate T. S. added, no precipitate or turbidity shall result, (absence of barium).

The purity of the salt can also be determined by titration with $\frac{N}{2}Na_2CO_3$ as described above. If the reaction of the salt used for titration is feebly acid, it should be neutralized with $\frac{N}{2}NaOH$ before titrating with $\frac{N}{2}Na_2CO_3$. The number of cubic centimeters used multiplied by .013767 indicates the amount of free salicylic acid present, which must be deducted from the original weight used. The number of cubic centimeters of $\frac{N}{2}Na_2CO_3$ used multiplied by .09914 will indicate the amount of pure strontium salicylate present.

Laboratory of Lehn & Fink, New York.

TRANSLATIONS.

Remedies from the Animal Kingdom in use Formerly and at the Present Time.[*]

By *B. Seybold.*

Linteola intinct. sanguine leporis,	Linen steeped in hare's blood.
Linteola intinct. spermate renar.,	Linen steeped in frog's spawn.
Lumbirici terrestres,	Earthworms.[15]
Mandibulæ lucii,	Pickerel jaws.
Margaritæ,	Pearls.
Mater perlarum,	Mother-of-pearl.
Mel commune,	Ordinary honey.
Mel virgineum,	Virgin honey.
Moschus,	Musk.[16]
Mumia cervi,	Deer mummy.
Mumia officinar,	Mummy.[17]
Mumia vulgaris,	Common mummy.
Mustella usta,	Incinerated weasel.
Nervi lupi,	Wolf-sinews.
Nidus hirundinum,	Swallow's nest.
Oculi lucii piscis,	Pickerel eyes.
" lupæ et lupi,	Eyes of a she- and he-wolf.
" lyncis,	Lynx eyes.
Os de corde cervi,	Bone from the heart of a deer.[18]
Ossa humana,	Human bone.
" sepiæ,	Cuttle-fish bone.
Ova formicarum,	Ant eggs.
" gallinacea.	Hen eggs.
" struthionis,	Ostrich eggs.
Pellis arietina,	Ram's pelt.
Pili cati combust,	Incinerated cats' hair.
" cervi,	Deer's hair.

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[*] From Apoth. Ztg. Translated for the Review by Richard Fischer, Instructor in Practical Pharmacy, University of Wisconsin. Continued from p. 110.

[15] Earthworms were carefully handled: before being used they were well washed with wine. Literature: Stahl G. E. pres. J. C. Fritschius resp. de lumbricis terrestribus eorumque usu medico Halæ.—1698—Juch H. P. pres. T. E. Weinknecht resp. de lumbricis terrestribus, Erfurt. 1742.

[16] Gessner mentions the following test: "Echter Bisam schwimmt auf Rosenwasser, die Verfälschungen sinken zu Boden." Concerning the origin of musk, Megenberg writes: "In des tiers leib wehset ain apostem (tumor) von gesamneter fäuchten, wenn das zeitig wird, so reibt sich das tier an ainem paum, unz daz apostem zepricht und der unflât her auz fleuzt. wenn das hart wird so haizt er ze latein muscus, das ist ze däutsch pisem."

[17] In using mummies, the action did not depend so much upon the dried flesh, as upon the balsams and resins that had been added as preservative agents.

[18] An ossified muscle in the wall that separates the chambers of the heart.

Pili hirci,	Buck's hair.
“ leporis,	Rabbit's hair.
Pluma perdicum,	Partridge feather.
Porcelletæ,	Porcelain-shells.
Priapus cervi,	Yard of a stag.
“ ceti,	Yard of a whale.[19]
“ tauri,	Yard of a bull.
“ ursi,	Yard of a bear.
“ vulpis,	Yard of a fox.
Propolis,	Beeglue.
Pulmo cervi,	Deer's lung.
“ ursi,	Bear's lung.
“ vituli,	Calf's lung.
“ vulpis,	Fox's lung.[20]
Rana arborea,	Tree-toad.
“ fluviatilis,	Water-frog.
Reguli usti,	Incinerated wrens.
Sanguis cervi,	Deer's blood.
“ columbar.,	Dove's blood.
“ hirci,	Buck's blood.[21]
“ hirci silvestr.,	Roebuck's blood.
“ hominis,	Human blood.
“ leporis,	Rabbit's blood.
“ porcelli,	Blood of a sucking pig.
“ porci,	Hog's blood.
“ vituli,	Calf's blood.
Scarabeus cornutus,	Stag-beetle.
“ majalis sive unituarius,	May-worm.[22]
Scorpio,	Scorpion.[23]
Secundinæ primiparæ,	After-birth of a first-born.
Sericum crudum,	Raw cocoon.[24]
Serpentes exsiccata,	Dried serpents.
Sperma Ceti,	Spermaceti.[25]
Sperma ranarum,	Spawn of frogs.
Spina mustella piscis,	Burbot's spine.
Spina viperarum,	Serpent's spine.[26]
Spongia marina,	Sponge.
Stercus angninus,	Snake excrement.
“ anseris,	Goose excrement.
“ cervinus,	Deer excrement.
“ columbar,	Dove excrement.
“ humanus,	Human excrement.
“ leonis,	Lion excrement.
“ murium,	Mouse excrement.
“ pavonis,	Peacock excrement.
“ vaccininum,	Cow excrement.
Stincus marinus,	Sea-lizard.
Tali capreoli,	Ankle-bone of a roe.
“ cervi,	Ankle-bone of a deer.
“ leporis,	Ankle-bone of a rabbit.
Talpa usta,	Incinerated moles.[27]
Telæ aranearum,	Spiderweb.
Testæ cancrorum,	Shell of a crab.
“ cochlear.,	Snail shells.
“ concharum,	Muscle shells.
“ ostreorum,	Oyster shells.
“ ovorum e quibus pulli exclusi sunt.,	Shells of eggs from which chickens have been hatched.[28]
Testiculi apri,	Wild boar testicles.
“ castoris,	Beaver testicles.
“ cervi,	Deer testicles.
“ equorum,	Horse testicles.
“ lupi,	Wolf testicles.
“ ursi,	Bear testicles.
“ vulpis,	Fox testicles.[29]
Testudo,	Turtle.
Typhus cervi,	“Hirsch Kolben.”
Ungulæ alcis,	Elk hoofs.
“ asini,	Donkey hoofs.
“ bovis,	Ox hoofs.
“ capræ,	Goat hoofs.
“ equi,	Horse hoofs.
“ lyncis,	Claws of a lynx.
“ mulae,	Mule hoofs.
Umbillici marini,	Sea-navel.
Unicornum fossile,	Fossil unicorn.
Unicornum magrinum,	Narwal.[30]
Upupa usta,	Incinerated cuckoo.
Urina hominis,	Human urine.
Ventriculi gallinarum exsicc.,	Dried chicken's stomach.
“ intestina gallinar. stomachar.,	The inner membrane from a chicken's stomach.[31]
“ lupi,	Wolf's stomach.
“ urogalli,	Mountaincock's stomach.
Verucæ equorum,	Warts from a horse.
Vesica apri,	Wild boar's bladder.
“ bovis,	Ox-bladder.
Vespertilio ust.,	Incinerated flying-squirrel.

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[19] Used as an aphrodisiac. Besides that, it was supposed to act as an astringent and therefore was administered in diarrhœa and hemorrhages. Dose, 1 scruple to 1 drachm. Pharm. Wirtemberg. 1760.

[20] "The fresh lungs are washed with wine and dried. They are recommended in pulmonary diseases and are required in the preparation of Looch de vulpis pulmone." Pharm. Wirtemberg, 1760. "Fuchslungensaft" is still sold in some localities.

[21] Lonicer says concerning this: "Dieses Tier ist dermassen hitzig von Natur, dass man den Demant, welchen weder Feuer noch Eisen zähmen und bewältigen mag, allein mit seinem Blut zerbricht. Bocksblut hat grosse Kraft, dass auch die scharffen Eisen damit geschärft und gehärtet, und von ihrer Grobheit mehr gereinigt werden, dann mit einer Feilen."

[22] Details can be found in: "Bekanntmachung des specifiquen Mittels wider den tollen Hundebiss, welches Sr. Königl. Majestät zum allgemeinen Besten vom Besitzer erkaufen, untersuchen und dessen Gebrauch in vorkommenden Fällen dem medizinischen Collegio und dem gesammten Publiko empfehlen lassen, durch höchst deroselben Ober-Collegium Medicum Berlin 1777."

[23] Compare Peters, Bd. II, p. 41 ff. Megenberg makes the following statement: Wer vergiftet wird von dem scorpen, der verzeuht drei tag ê er sterb | und spricht man | wer den scorpen aschen in wein drink | das sei ain erznei dâ wider. — der scorp hât ein art | das er des Menschen teur (sc. palma — flat of the hand) in der Hand nicht hekt | er rüert neur rauch stet gern | dâ hâr ist | und daz öl | das von den scorpen kümt daz ist guot für sein pizz | also daz man die wunden damit salbt.

[24] Compare Peters, Bd. II, S. 21 ff.

[25] Compare Peters, Bd. II, S. 27 ff. Lonicer reports: "Walsaat oder Walsam, Walrode, wird für den Saamen oder Natur des Wallfisches gehalten, und daher also genannt, heisst auch Baldrath, weil er bald hilft und Rath thut in etlichen Gebrechen also sonderlich wider das gestürzte Blut. Das Sperma Ceti wird auf dem Meer gefunden. Die Meerfischer sagen es sey der Saame des Wallfisches.

[26] Gessner gives two folio-pages on the wonderful effect of vipers; among others, the following: "Ein gleych Fall hat sich (says Galenus) nit weyt von unsern heimat begeben: Ein aussetziger und maltziger man zoche zu warmen bädern | dess vorhabens seiner Krankheit darin abzuwarten und dadurch zu heilen. Dieser hat bey sich eine schöne junge leybeigne Köchin | der er alle haushaltung vertrauwet und übergab. Als aber vil nattern zunechst umb jr herberg schweifften | und sie den weynkrug nit wohl vermachet und verwart | schloff ein natter darein | und ertrank darinn. Die Köchin ward dessen froh | wolt sich des mittels zu des sondersichen verderben gebrauchen | und gab ihm den weyn zu trinken | aber das glück spilte das gegentheil | und gerieth zum besten | also dass er darauf widerumb frisch und gesundt wardt."

[27] "Wenne man den schern prennet ze pulver und sprenget in mit ain waizen ains ais auf der siechen antlütz, daz ist guot für den auzsetzel." Megenberg.

[28] The Pharm. Wirtemb., 1760, gives the following: "Die Schalen aus denen durch Bebrüten Junge ausgekrochen sind, werden für besonders wirksam gegen Nierenleiden und zum Abtreiben von Harnsteinen gehalten. Doch zieht man getrocknete und zerriebene den gebrannten vor."

[29] All these were employed as aphrodisiacs.

[30] According to Valentinis, the true remedy is obtained from the fish norwal. The existence of a quadruped by that name is denied. The "unicorn" as found in the market came from the above mentioned fish only. A wonderful case of antidotal action in acute poisoning is reported from Augsburg, but the author does not believe that the results can be ascribed to the unicorn alone. Unicorn. fossile is also mentioned. Concerning its source, the various ideas then prevalent are given without the author's deciding in favor of one or the other.

Gessner reports the following tests: Administer to two doves some arsenic, in one case accompanied by some unicorn. If the dove to which no unicorn has been given, dies, the unicorn is genuine.

[31] Therefore a precursor of "Ingluvin", which for several years has been used as a "new remedy".

Viperæ italicæ,	Italian vipers.
Vulpis exsicc. et ust.,	Dried and incinerated foxes.
Zibethum,	Civet.

The number of remedies furnished to medicine by the animal kingdom previous to this time must have been extremely large. The above list includes 310 remedies, of which 79 are fats. The last edition of the Pharm. Germanica has only 13 official.

For a long time, even to the end of the last century, these remedies retained their place in the pharmacopœias and price-list. In old apothecary-shops, a greater or lesser number of these curiosities can still be found. It is therefore small wonder that among the common people a number of such things are still being employed for curing disease.

(To be continued.)

MONTHLY REVIEW.

The Function of Pharmacy in the Social Body, its Responsibilities to the Public and to the Physician.*

By Prof. *A. B. Prescott.*

Although the position of the poet, the minister of the gospel and even of the lawyer is essentially the same as it was a hundred and more years ago, the position of those callings dependent on the modern growth of the natural sciences has been radically modified. So medicine, pharmacy and chemistry have been revolutionized. Chemistry outgrew medicine and in this century pharmacy, as the speaker demonstrated by the life history of the principal chemical journal of to-day, the Annalen der Chemie, which began its history as Annalen der Pharmacie by the amalgamation of several pharmaceutical journals under Liebig in 1832.

Specialization, however, is going farther. It has already affected medicine to a considerable extent and even chemistry and pharmacy have felt its influence. The pharmaceutical manufacturer, who must be included in the ranks of pharmacy, is a product of this specialization.

Pharmacy, like other callings and institutions, is a product of our present-day civilization. The pharmacist is under obligations to the medical practitioner on the one hand and to the public on the other. The pharmacist, however, has obligations to the public other than as a mere check between the physician and his patient. The citizen is free to select not only his medical adviser, but he may chose to go to the apothecary as well as to his neighbor or relative. In fact he can choose his own remedies without the recommendation of anyone. This places the pharmacist in a position that is often fraught with great responsibility and risk. Not only in selling medicines to persons acting as their own physicians, but in selling poisons in general, whether for medicinal or other purposes, the responsibilities of the pharmacist are greater than the recompense for such services. It is but natural that the people should frequently go to the pharmacist for advice, and it is equally true that the pharmacist is not responsible for the duties of another. In the latter respect he is not even responsible for the sale of secret medicines as long as their sale is lawful. Nevertheless it were better, no doubt, to restrict the sale of poisons in medicines of secret composition to the skilled as well as that of poisons known as such to the public.

The tendency of the public is to place due restriction on the sale of such articles, as is manifested by recent legislation against deceptions in the sale of foodstuffs and beverages as well as of drugs and medicines. This change is taken advantage of by designing men and a good degree of conservative prudence and a great deal of patience is needed during this transitional stage of modern development.

Pharmacists as a profession have done much in unravelling the secrecy of secret proprietary medicines. They, as individuals, occupy positions of responsibility as pharmaceutical and analytical chemists. They will in the future assume the position as medical chemists. "The new pharmacy is not a chimera, nor a dream. Neither is it only a prophecy, the prophecy of clear sighted men, that the new pharmacy is to take up medical chemistry in its full extent. It is already an individual purpose. Business ability is making a study of the ways and means for a pharmacy that shall fill its true office in the practice of medicine. It is not for me to say where the model of a pharmacy is being planned, nor where it will arise and assert itself in the United States. However conspicuous the departure may be, there will be numbers having a like intent. There are even now modest young men who are at work, men richer in qualifications than in money, but most rich in determination, not lacking in tact, enthusiastically at work upon the arrangements. The foundations of the new pharmacy are being placed, and it will be well established in business before the century closes.

"Physicians will make a great mistake if they do not support true pharmacy, even the new pharmacy, and encourage medical analysis in the hands of the pharmacist. It will be a mistake for themselves as well as for the public. Let the physician do as much analytical work with his own hands as his time and his skill will permit. There is much medical analysis requiring more continuous attention than the doctor can give. When there is more laboratory work than the physician can compass, let him find the pharmacist of analytical training and judgment. He ought to find the right man in the new pharmacy. Its laboratory, with instruments of precision and skilled attendant not subject to interruptions by visits to the sick, is to be at the service of the physician.

"The profession of medicine cannot afford to be indifferent to the interests of true pharmacy. They cannot afford to furnish their patients mainly with the ready-made remedies of the manufacturer, all cut out in sizes like so many ready-made coats. Ready-made things never fit the individual to perfection, even when the person is in health and with full bodily symmetry. How then shall ready-made medicines fit those who, being sick, are out of shape in the balance of the body? A man whose two shoulders do not square with each other will not buy a ready-made coat. How long will the man whose functions are deranged be satisfied with the administration of a formula in pellets made up by the manufacturer for everybody all alike? Sickness is idiosyncrasy, and intelligent people know it. Therefore it is that they apply to a physician, to have treatment to fit each case by itself. Otherwise they would think they could fit themselves without the physician's aid, something they are only too much inclined to do.

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* Abstract from an address delivered before the Minnesota Pharmaceutical Association, at Lake Minnetonka.

"It is by co-operation of true pharmacy, with its precise adaptation of identified medicines of exact strength and purity, that the physician can best maintain his own profession in the eye of the public. It will be by means of the new pharmacy and its laboratory of chemical and microscopical examinations where analyses go on in undisturbed seclusion that the physician can the better satisfy his own mind in the more perplexing cases that sometimes turn the balance for him or against him in the minds of his patrons. We may be sure that true pharmacy will earn its own place in the organization of society.

"Nothing that I have said should be so misunderstood as to imply a want of respect for the trade interests of the present time. The commercial pursuit is honorable equally with professional practice. The mercantile virtues are among the best elements of character. The business training of a good drug trade, with its thrift and frugality and industry, its good order in respect to time and place and system, these give the young man good discipline indeed. Young men may be assured that, whether in the college or in the school, it is industry and fidelity that will win, it is negligence and duplicity that will fail. Steady work and honest pluck succeed in study, or succeed in trade.

"So in the organization of the pharmacists of any state, commercial interests are a proper subject of deliberation and concern. At the present time business at large is laboring under depression and anxiety, in all which pharmacy bears its share. And it has a heavier load in the commercial difficulties of its own affairs. When I hear from well qualified pharmacists, of various cities in my own state and elsewhere, as they tell me in the candor of personal confidence, how neither business activity nor economy has availed to bring returns of encouragement, I must confess I share in their depression. Good men whom I knew when they earned their way to college and through college, and who have worked through the service of the assistant with unfailing credit in the best of establishments, and who have set up for themselves in such a way as to gain for some years the best business to be had, tell me they find themselves at times barely able to hold their own in the struggle. Only this I can tell them, they may thank the advantages of college training for so much, that they can hold their own in the very hardest of seasons.

"I do not receive as much confidence from the men of other pursuits. I do not know as well the besetting difficulties of other lines of business. I do not try to compare the condition of pharmacy with that of other professions, or to give a young man any advice, whether he should choose pharmacy from among the pursuits or not.

"This much I can always say, and with emphasis, to any young man not yet in pharmacy. If you are going on without a good general education, surely not less than the best high school preparation, do not enter pharmacy. If you will not plan to give yourself the advantage of a thorough-going pharmacy school, do not take up the work of the drug store. Unless you can study effectually to be a pharmacist, turn toward something else. There are plenty of callings honorable enough without scholarship. At any rate, in the future, for those who have yet to begin, pharmacy will not be profitable without scholarship. Starting at this time in the century, it will not pay you to be an unlearned pharmacist. And if you are only just able to pass through an ordinary state board examination, pharmacy will not pay you as well as some other calling.

"And for the same reasons, let me say, pharmacy is a promising field to young men of intellectual industry. It is where the best scholarship counts the highest. To the young man of intellectual earnestness pharmacy is a most attractive profession. Very few successful students, within my observation, ever abandon pharmacy for other pursuits.

"It is the duty of the state to provide thorough pharmaceutical education. This requires no argument, to the people of Minnesota. It is a statement that hardly requires defense. Any argument against it is equally good as an argument against primary or grammar-school education at the public expense. The subject, however, is an inviting one, and to do justice to its merits would require an address in itself. Pharmacy is founded in the sciences, and the foundations of its schools should be the broadest and deepest of educational institutions. Pharmacy needs the libraries, the laboratories, the authorities of an university,—needs in greater part the same libraries, and the same laboratory appliances, and the same authority in science, which the other parts of the university must be provided with for their own demands. The university is the best home for pharmaceutical study."

Trademark and "Wortschutz".

In the interest of the chemical industry and the trade in its products, the discussion of a question which has caused quite a commotion in interested circles as well as in the legislative and executive branches of the government, may be justified. It is the question of the results of the law of May 12th, 1894, in regard to protection in the naming of articles, in which wordmarks are granted as exclusive privileges in the German Empire.

Seeing that numerous inconveniences would result if any interested person were allowed to monopolize a part of the general vocabulary, the legislator found it necessary to introduct of number of cautels. In consequence the conception of what constitutes a wordmark worthy of protection has become very vague. Since the enactment of the law there has been occasion for plenty of dispute, and the underlying principle is so illdefined that, since it cannot be replaced by a number of single exactments, it is a question whether the good has reached those for whom it was intended.

The wordmark seems to us an institution claiming legality on very uncertain ground between patent right and trade mark right.

The wordmark vests in a person the exclusive right to give a certain name of his own choice to an article. Like the patent right it is associated with one certain thing and therefore naturally it is considered as a sort of indirect patent right, or rather as a means of securing a right of exclusive use, which is not founded on the patent right and without the time limitations and the increasing expense connected with securing the latter.

The experience here seems to be as it always is when a principle rests on an unsound basis. While it is correct that the use of words taken from the general vocabulary cannot justly be granted to one person as an exclusive right, the consequence is that the most fantastic names are invented, from which no one can conjecture what article the name stands for. It seems to be putting a premium on burdening the language with monstrous and meaningless word-formations.

This surely cannot be entertained at a time when public and private efforts are directed to the purification of the language.

The system of the wordmark does not directly reward the producer but the trader. Unlike the patent right it fails to stimulate inventive activity, but aids the most commonplace and ridiculous advertising. It may ultimately benefit the inventor, yet it is always bad to try to accomplish a laudable object in such a questionable way.

It is easily understood how we have come to this. In our time the pursuit often has grown so hot, that it is full of prohibitory tendencies, while at the same time confessing loyality to the principle of liberality which is really a remnant of a time gone by. Hence the singular methods of obtaining privileged positions, which one does not dare to demand outright.

The conflict between rivaling tendencies is nowhere more apparent than in the British commercial policy, which, while formally adhering to the principle of free trade, loves to turn to measures that actually oppose it.

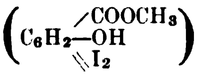
This was very apparent from the consequences which the commentators on the provisions of the law for the suppression of false marking attributed to it. It seems to us that with the acknowledgement of the advisability of the wordmark we will be introducing a large part of these tendencies here.

[Gehe and Co's Handelsber., April '96.]

Chemistry.

Sanoform.

This is the name given to a new antiseptic which is chemically the methyl ester of di-iodosalicylic acid,



$$\left(C_6H_2 \begin{cases} COOCH_3 \\ OH \\ I_2 \end{cases} \right)$$

and is produced by the action of iodine on methyl salicylate. The new remedy contains 62.7% of iodine; it occurs as a finely crystalline powder, odorless and tasteless, soluble in 10 parts of hot alcohol, readily soluble in ether and in vaseline.

Its high melting point as well as its stability recommend its use in the manufacture of antiseptic gauzes, which can be sterilized without loss or decomposition. According to Longgard, sanoform is not poisonous, causes neither local nor general irritation, and being at least as active as iodoform is preferable on account of its lack of odor.

[Pharm. Centralbl., 1896, No. 21, p. 313.]

Fermentation of Uric Acid.

E. Gérard has been able to decompose uric acid into urea and ammonium carbonate by the action of micro-organisms. The acid was dissolved in a solution of sodium diphosphate, and the liquid exposed to the air. After four days exposure it was rendered turbid by micro-organisms that had been attracted, and the presence of free ammonia was indicated. Variations in the products of the biochemical action seemed to indicate that if the action were allowed to continue, the urea would in time probably be decomposed, and ammonium carbonate be the sole product.

[Pharm. Journ., 1896, p. 421; from Compt. rend. 122, p. 1019.]

New Synthesis of Urea.

P. Cazeneuve finds that the guaiacol carbonate of Heyden, in contact with alcohol saturated with ammonia gas, is converted rapidly in the cold into ordinary urea and guaiacol. As the crystals gradually dissolve in the liquid, the latter assumes a yellowish tint, and then becomes greenish, the process being accelerated by heating to 50° C. The urea is in long needles on evaporating the solution, and can be purified by recrystallization from alcohol.

[Pharm. Journ., 1896, p. 421; from Compt. rend., 122, p. 999.]

Origin of Argon and Helium in the Gas from Sulphuretted Waters.

According to Louis J. Troost and Léon V. R. Ouvard the gases extracted from the water of the Seine, and from sea water, contain argon, but only very feeble and often uncertain traces of helium. The gases from the sulphuretted waters of Canterets, on the other hand, contain helium in distinct and readily recognizable quantities. The authors are of the opinion that the helium is not derived from the atmosphere, but from minerals such as cleveite, bruggerite, monazite, etc., in the rocks through which the waters percolate.

Bouchard considers that although it may not be possible to attribute any special therapeutic action to the argon and helium present in the waters referred to, it is quite conceivable that compounds of them may be dissolved in the waters, and exert an important influence on their therapeutic effects.

[J. C. S., 70, p. 298; from Compt. rend., 121, p. 798; Bouchard, ibid., p. 800.]

Action of Alcohol on Mercurous Iodide.

Although alcohol is commonly employed in the preparation of mercurous iodide, it is not without action on it, especially when heated. As shown by Maurice Francois, alcohol decomposes the iodide into mercuric iodide and mercury, and the decomposition ceasing when the boiling alcohol of 95° contains 0.222 gram of mercuric iodide in 100 grams of the liquid. With a higher proportion, the solution acts on mercury and converts it into mercurous iodide until the limit is reached. 1000 grams of boiling alcohol of 95° will decompose about 3.15 grams of mercurous iodide; the alcohol commonly employed for washing mercurous iodide gradually decomposes it, removing mercuric iodide and leaving mercury; and the two iodides cannot be accurately separated by means of alcohol.

[J. C. S., 70, p. 301; from Compt. rend., 121, p. 888.]

Thiopyrophosphates.

Reference was recently made to the fact that M. Ferrand had prepared a number of thiophosphites, corresponding to the general formula M_3PS_3. He now describes another series of compounds corresponding to the formula $M_4P_2O_7$. Copper thiopyrophosphate, $Cu_4P_2S_7$, occurs in violet crystals which are red by transmitted light. Iron thiopyrophosphate, $Fe_2P_2S_7$, is in small crystalline lamellae; silver forms a yellow crystalline mass ($Ag_4P_2S_7$); nickel a dark-brown crystalline powder ($Ni_2P_2S_7$); chromium a black crystalline powder ($Cr_2P_2S_7$); zinc, small needles ($Zu_2P_2S_7$); cadmium, a white crystalline powder ($Cd_2P_2S_7$); mercury, a red crystalline powder ($Hg_4P_2S_7$); lead also forms a reddish crystalline powder ($Pb_2P_2S_7$); and aluminium, a mass of small white needles ($Al_2P_2S_7$). The compounds $Cu_2P_2S_7$ and $Hg_2P_2S_7$ have not so far been obtained. The nickel, chromium, zinc, mercury, and aluminium salts decompose readily in moist air or water; alkalies also attack some of the compounds, and acids practically all of them.

[Pharm. Journ., 1896, p. 421; from Comp. rend., 122, p. 886.]

Abstract from W. E. Stone's Report: A Year's Progress in the Field of Carbohydrates.

During the year 1895 the activity devoted to research among the carbohydrates has in no wise abated, and although no results of a striking character have been obtained as compared with those of some recent years, there has been evident progress toward a more definite and scientific knowledge of these bodies.

The most important general reaction of sugars brought out during the year is the so-called glucoside synthesis discovered by Fischer and his pupils. Although the reaction was noted in development in 1894, its perfected form has been announced during the last year. Ether-like compounds between the sugars and a considerable number of alcohols are made by mixing the constituents and subjecting them to the action of a very small amount of hydrochloric acid.

New Carbohydrates:—The substance volemite, mentioned by Bourquelot as being obtained from the fungus *Lactarius volemus* is identified by Fischer as a heptavalent alcohol or heptite, $C_7H_{16}O_7$, which by mild oxidation is converted into heptose.[1] This differs from the synthetic gluco- and gala-heptites and constitutes the second known natural heptite.

A substance has been obtained from young rye plants which is soluble in water with a specific rotation of $(\alpha)_D = 28°.9$, and easily converted into levulose. The name of β-levulose, or preferably secalose, has been assigned to it.[2]

The sugar agavose, from the *Agave Americana*, has been shown to be sucrose.[3]

By acting on amygdalin with the yeast enzyme which converts maltose into dextrose, it is found that one-half of the theoretical amount of sugar is set free. There remains a new substance, which upon hydrolysis with hydrochloric acid, breaks up into benzaldehyde, prussic acid and a second molecule of dextrose.[4] This would indicate that amygdalin contains a maltose molecule, one-half of which can be split off without affecting the glucoside structure.

The physiological aspects of the pentoses and pentosans still attract attention. Sixty-five percent of the pentosans in fodder was digested by sheep and fifty-three percent by rabbits. That portion digested did not seem to be assimilated, since pentoses constantly appeared in the urine of the animals.[5] Pentoses are frequently noted in urine and the pheunomenon is the excuse for a new term "pentosurie."[6] This occurence does not accompany diabetes and is not to be regarded as an alarming condition.[7]

Dextrose has been obtained by the hydrolysis of cocoanut shells,[8] and from sumach (*Rhus*).[9] The sugar obtained from indican, either by hydrolysis or ferments is dextrose.[10]

Levulose has been prepared from orange peel.[11]

Galactose has been obtained from the gum of *Acacia decurrens*, which probably contains a galacto-araban complex capable of hydrolysis.[12] Compounds of galactose with alcohols and phloroglucin have been noted.

Sucrose.—As the result of rather extended observations by himself and his pupils, Schulze regards sucrose as a form of reserve food in the plant, derived probably from starch of which it is a transport form.[13] Of interest are the recorded occurrences of sucrose in seeds and plants from which it has been separated by the strontian method. Among seeds containing sucrose, are noted oats, rye, wheat, buckwheat, ripe and unripe peas, soja bean, peanut, hemp, sunflower, coffee and lupine; sucrose is found in etiolated germinating plants of lupine, sunflower, vetch and potato; in green plants of rye, vetch, potato, elder and hazel; in tubers of potato and roots of the carrot and in the flowering buds of the pear.

It has been claimed that citric acid is produced when sucrose is oxidized by potassium permanganate, but this has been vigorously denied by several experimenters who at least have been unable to obtain the results described.[14]

Amorphous Carbohydrates: — An amorphous substance extracted from *Polyporous betulinus* has been named paraisodextran. Its formula is $C_6H_{10}O_5$, and by hydrolysis it yields dextrose.[15]

The pectins are regarded by Tollens as being closely related to the carbohydrates as chiefly indicated by their hydrolytic products. It is pointed out that they are of an acid character, as shown by their solubility in alkalies. It is probable that they contain the carboxyl group, COOH, and that they are oxy-derivatives of the mucous bodies.[16]

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[1] E. Fischer. Ber., 28, p. 1973.
[2] Schulze and Frankfurt, Ibid., 27, p. 3525.
[3] Stone and Lotz. Am. Chem. Journ., 17, p. 368.
[4] E. Fischer, Ber. d. chem. Ges., 28, p. 1508.
[5] H. Weiske, Ztschr. physiolog. Chem., 20, p. 489.
[6] E. Salkowski, Berl. Klin. Woch. Schr., 32, p. 364.
[7] F. Blumenthal, Ibid., 32, p. 567.
[8] Tollens and Tromp de Hass, Ann. Chem. (Liebig), 286, p. 386.
[9] C. Böttinger, Archiv. f. Pharm., 233, p. 125.
[10] C. J. van Bookeren, Landw. Versuch Stat., 45, p. 195.
[11] R. W. Bauer, Landw. Versuch. Stat., 45, p. 293.
[12] W. E. Stone, this journal, 17, p. 196.
[13] E. Schulze and S. Frankfurt, Ztschr. physiolog. Chem., 20, p. 511.
[14] T. Phipson, Chem. News, 71, p. 296; also 72, p. 31, 100, 165, 190, 235, 268.
[15] E. Winterstein, Ber., 28, p. 774.

Cellulose.—The researches of Cross, Bevan and their associates, upon cellulose, are among the most interesting of those of recent date on the carbohydrates, especially in view of their technical application.[17]

The general results of these investigations go to show that cellulose, in the general sense, or the fibers of plants are not at all of homogeneous character. The different constituents of cellulose are distinguished by their resistence to or behavior toward certain reagents. Typical cellulose is a polyhydroxylated body, forming a variety of compounds with acids and alkalies, such as alkali-cellulose-xanthate, acetyl, benzoyl and nitrated compounds.

Compound celluloses or ligno-celluloses, found in plant fibers, are regarded as more or less oxidized derivatives of pure cellulose. These latter are unstable and tend to form cyclic compounds, such as furfurol, lignone, and keto-R-hexene bodies.

[Am. Chem. Journ., 19, p. 504.]

Action of Ferments and Enzymes on Carbohydrates.

In his report on the year's progress in the field of carbohydrates, W. E. Stone reviews the work done under this chapter as follows:

Increased attention has been given to the action of yeasts and enzymes upon sugars. It appears that many of these agents act selectively, inverting certain sugars and not affecting others.[1] Ordinary beer yeast yields a soluble substance, which inverts both sucrose and maltose. A similar extract from the "kefir" yeast inverts lactose. An extract from *Schizo-saccharomyces octosporus* completely inverts maltose, but is without effect on sucrose. From *S. maximus* was obtained an enzyme with exactly the opposite property of inverting sucrose, and not maltose. These enzymes receive the names of invertin and maltase. *Monilia candida* contains maltase, but not invertin. It is well known that different species of yeast are of quite different fermenting powers, and this is doubtless due to their specific enzymes.

Melibiose, resulting from the partial decomposition of raffinose is not affected by invertin from ordinary yeast.[2] This is proposed as a means of estimating raffinose, solutions containing the same to be inverted by invertin, leaving the melibiose unchanged.[3] Maltose behaves differently towards the invertin of yeast and the glycase of grains.[4]

Fischer shows in an interesting way that the action of enzymes on sugars is modified by the configuration of the latter.[5] For instance, only those glucosides which contain the dextrose molecule are susceptible to the yeast enzyme. Emulsin, however, acts upon glucosides containing either the dextrose or galactose molecule. Only the so-called β-galactosides were so decomposed, and since lactose shows the same relation, it is regarded as having a similar constitution. The methyl derivatives of gluco-heptose, rhamnose, arabinose and xylose are not so affected, and it is noticeable that they all belong to the "*d*-dextrose" series. These data will also throw light upon the constitution of the disaccharides. For the three best known of this group, sucrose, lactose and maltose, exist specific enzymes, invertin, maltase and lactase. The behavior of the less definitely studied di-saccharides toward these enzymes will establish their relationship to one or the other of those whose structure is to some extent known.

[Am. Chem. Journ., 19, p. 513.]

Botany and Pharmacognosy.

Glucoside in Monotropa.

E. Bourquelot has previously shown that methylsalicylic ether can be extracted from several species of *Polygala* and also from *Monotropa hypopitys*, but he was of the opinion that the compound did not naturally exist in the plants, and has now been able to prove that it is formed in the case of *Monotropa* from a glucoside existing in that plant. The glucoside is accompanied by a ferment capable of decomposing it, and the same ferment has been found in all the plants yielding methylsalicylic ether. After commenting on the work of Procter, who found, in the bark of *Betula Cuta*, a glucoside, gaultherin, and a soluble ferment capable of giving rise to methylsalicylic ether, and that of Schneegans and Gerock, who isolated the glucoside in crystalline form, the author sums up the facts as follows:—

1. There is a soluble ferment capable of hydrolizing gaultherin in the roots of *Spiraea almaria*, *S. filipendula*, *S. salicifolia*, and *Polygala sp.*, in the bark of *Betula Cuta*, the leaves and fruits of *Gaultheria procumbens*, and the petals of *Agalea sp.;*
2. In *Monotropa hypopitys* there exists a glucoside which can be hydrolized by the same ferment, and is, therefore, probably identical with gaultherin;
3. Neither gaultherin nor the glucoside of *Monotropa* can be hydrolized by any other known ferment.

Schneegans has recently suggested the name "betulase" for the ferment discovered by Procter, but Bourquelot prefers "gaultherase," as recalling the glucoside upon which it acts.

[Pharm. Journ., 1896, p. 421; from Compt. rend., 122, p. 1002.]

Opium Imports at Kiungchow.

According to the latest Consular Report the amount of the opium imported by steamer during 1895 is larger than in 1894, the value being £23,702 for the latter year and £27,389 for 1895. By far the largest quantity of the drug is, however, imported by junk in order to evade the heavy customs and "likin" levies. The value of the import by steamers in 1886 the year before the Opium Convention came into force, was £171,100, and it has diminished every year since then until the one under review, the value in 1894 being only £23,702. The rise in price of the Indian drug accounts partly for the small import in 1894, but practically the diminution is due to the success with which smuggling junks evade the cruisers sent to protect the revenue. It is calculated that about 1000 chests find their way to the island every year without paying the legal duty. Only two captures were made by the cruisers during the year, amounting together to some 33 chests. The importation of native opium is said to be on the increase in consequence of the rise in price of the Indian drug.

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[16] Tollens and Tromp de Haas, Ann. Chem. (Liebig), 286, p. 278.

[17] Cellulose, by Cross and Bevan; Longmans, Green & Co., 1895.

[1] B. Fischer and P. Lindner, Ber. d. chem. Ges., 28, p. 984.

[2] Ibid., p. 3034.

[3] A. Bau, Chem. Zeit., 18, p. 1794.

[4] C. Lintner and B. Kröber, Ber. d. chem. Ges., 28, p. 1050.

[5] Ibid., 28, p. 1429.

Criminal Poisoning in Hong Kong.

A lecture on this subject was given at Hong Kong last month before the Odd Volumes, by Mr. W. E. Crow, Pharmaceutical Chemist and Government Analyst. He confined his remarks for the most part to poisonous agents concerning the use of which, in the colony of Hong Kong, authentic records are in existence. So far as the Chinese are concerned opium in the form of aqueous extract is the only poison used by suicides. Other poisons used for grave offences are but few in number, the chief being aconite, arsenic, *Datura alba*, Nees, and *Gelsemium elegans*. The Chinese know white arsenic as Pak-Sun-Shek, realgar is Hung-Nong, orpiment is Tsz-Nong, and a mineral containing arsenic oxide and sulphides is known as Hung-Sun. Aconite root from various species is indifferently termed Ts' ó ù, the root of *Gelsemium elegans* is sold under the name of ú mun kéung, while in South China the plant is commonly termed tün ch'eung ts″o, and the datura plant is known as Nun Yeung Fa. Fish have been poisoned by the seeds, freed from oil, of *Camellia oleifera*, Ch'à tsai ping, or Ch'à fu. With regard to the importation of morphine into China, Mr. Crow expressed the opinion that China, through her foreign customs, can effectually stop the traffic if she wills it.

[Pharm. Journ., 1896, p. 433.]

Another Arrow Poison.

As the result of an investigation of an arrow poison used by the natives of the Philippine Islands, Carl Gärtner has come to the conclusion that the fatal action is due to a direct effect on the ganglia of the heart itself. This is not the first arrow poison found to act in this manner; the substance called Dajaksch used in Borneo, also a similar substance known as Upas autiar belong to this class.

This new poison is obtained by extraction with water from the bark of a tree called by the natives, Abuhab, known to science as *Rabalaisia philippinensis*, of the Euphorbia family.

The solution used in the experiments contained in 10 ccm. the active principle extracted from one gram of the comminuted bark. The hypodermic injection of 0.1 ccm. of this fluid was fatal to frogs; a dose of 0.3 ccm. resulted in death after 56 minutes. When 0.5 ccm. was administered, a remarkable result followed. The death of the heart took place in 8 minutes, whereas, breathing, muscular reaction to mechanical irritation and voluntary muscular movements were still seen. The heart was killed and the remainder of the organism was, for the time being, as yet unaffected. The author remarks that, had the frog not been opened to allow observation of the heart's action directly, the animal for hours would have given no evidence externally discernable of the death of the heart. In view of the well-known temporary mutual independence of heart and of body in the frog, this seems not at all a rash statement.

The minimal fatal dose administered hypodermically to rabbits was found to be 0.4 ccm. per kilogram. The general weakness and the spasmodic struggles here seen were regarded as merely secondary results following the interference with the heart's action.

[Beobachtungen über die physiologische Wirkung eines neuen Pfeilgiftes, etc. Inaugural Dissertation, Erlangen, 1895.]

Behavior of Caffeïne and Theobromine in the Organism.

The administration of large doses of caffeïne to dogs as demonstrated by Manfredi Albanen, is followed by greatly increased secretion of urine, from which a monomethyl-xanthine, $C_6H_6N_4O_2$, probably identical with that obtained by Solomon (Abstr. 1886, 266), may be separated. A dose of 1 gram of methyl-xanthine administered hypodermically to a dog weighing 8 kilos caused death in 10 days; in smaller doses, it acts as a diuretic and must be considered as an intermediate product in the transformation which caffeïne undergoes in the organism, for very little of it is excreted when hypodermically injected. After the administration of caffeïne in the food of a dog, small traces of it can be extracted from the urine.

Xanthine is not a normal constituent of the urine of rabbits; after administering caffeïne, the urine contains small quantities of caffeïne but no methyl-xanthine. A dimethyl-xanthine, $C_7H_8N_4O_2$, and caffeïne can be separated from human urine after caffeïne has been taken internally.

It is thus evident that in its passage through the organism, methyl groups are removed one by one from caffeïne until xanthine is finally obtained, and converted into ammonia and urea.

Methyl-xanthine, injected into the jugular vein of rabbits, acts as a very powerful diuretic, the secretion of urine being increased to more than 40 times the normal.

Theobromine, when administered internally to dogs behaves like caffeïne; small quantities of it are excreted, and a larger proportion appears in the urine as methyl-xanthine.

[J. C. S., 70, p. 319; from Gazzetta, 25, ii, p. 298.]

Practical Pharmacy.

Capsules and Pills intended for solution in the intestines.

Several processes have recently been patented for the manufacture of the above. The process of C. F. Hausmann (St. Gallen, Switzerland) consists in placing gelatin capsules, after filling in the usual manner, into a 0.8% solution of formic aldehyde for 18 minutes, washing with water and drying at 50° C., whereby they are so changed as to become insoluble in the juices of the stomach, but are readily dissolved by the pancreatic ferment of the small intestines. The results of Weyland (Therap. Monatsh., Heft 3, 1896) showed that the solubility of the gelatine depended upon the concentration of the formic aldehyde solution, and upon the time of maceration. When carefully prepared, the gelatin had the following properties: It was insoluble in water at 38° C. but was dissolved by the prolonged action of boiling water. In artificial gastric juice the hardened gelatin is very difficultly soluble, 10—12 hours being required; ox-gall acts similarly. In artificial pancreatic juice, the gelatin is dissolved in 1—2 hours whether previously macerated in gastric juice or not.

According to the same patent, gelatin capsules can also be hardened by maceration in potassium bichromate solution and subsequent bleaching, which treatment renders them insoluble in water.

The pills are coated as follows: Dissolve shellac in a solution of borax, evaporate to dryness, remove the excess of borax by lixiviating with alcohol and filtering, and evaporate the alcoholic solution. The glue-like residue, called keratoid, is again dissolved in alcohol and used for coating pills. After drying, the coated pills are agitated for two hours with 33% acetic acid and the whole process is repeated.

[Pharm. Centralh., 1896, p. 360.]

Estimation of Morphine in Opium.

For this determination, G. Looff employs sodium salicylate and benzol for the removal of resinous matter and of narcotine. He recommends the following method:

5.0 g. of finely powdered opium are rubbed up with 5 ccs. water, the mixture then diluted and rinsed into a tared flask, after which enough water is added to make the contents weigh 44 g. The flask is then stoppered and agitated for 15 minutes when 1 g. of sodium salicylate is added, the mixture shaken a few minutes longer and filtered. 25.8 g. of the filtrate (corresponding to 3 g. of opium), are treated with 3 g. of ether and 1 g. water of ammonia and thoroughly shaken for 10 minutes. The morphine that separates out is collected on a small smooth filter and the flask rinsed twice with 5 ccs. of water, and the rinsings added to the filter. After drying on the filter, the morphine is washed with benzol, again dried, and weighed.

When rubbing up the opium with water, the author recommends trituration with little pressure, as otherwise the opium is liable to pack. [Ap. Ztg., 1896, p. 192.]

Creasote Pills.

One of the most difficult pill-masses to make is that of creasote, especially when large quantities of creasote are prescribed. A large number of formulas have already been published in pharmaceutical journals for the manufacture of these pills, the most important of which will be here recapitulated:

1. With magnesium oxide, yellow wax and cacao butter. 2. With potassium bicarbonate and ext. of liquorice. 3. With glycerin, althea root, liquorice root, and mucilage of tragacanth. 4. With ext. of liquorice, glycerin, and powd. liquorice. In the supplement to the German "Arzneibuch," the following is found: Creasote 10.0, Pulv. rad. liquirit. 19.0, Glycerin 1.0.

After a thorough test of the above methods, S. Kathrein found none to be thoroughly satisfactory. A mass that can be rapidly mixed and is satisfactory in every respect, can be prepared as follows:

℞. Kreasoti e fago 10.0.
Pulv. rad. Liq. 20.0.
Album. ovi. rec. q, s. (5.0).

M. f. l. a. massa pil., e qua forment. pil., No. 100. Each pill contains 0.1 g. creasote.

[Zeit. d. all. öster. Apoth. Ver., 1898, p. 232.]

Literary.

Books and Pamphlets Received.

A. Hartleben's Verlag—Wien. Medicinische Specialitäten. Eine Sammlung der meisten bis jetzt bekannten und untersuchten Geheimmittel und Specialitäten, mit Angabe ihrer Zusammensetzung nach den bewährtesten Chemikern. Von C. F. Capaun-Karlowa. Dritte vermehrte, mit Einleitung und vollständigem Register versehene Auflage von Dr. pharm. Max von Waldheim. Ein Bd., pp. xii, 259. 1896. Geh. M. 3.25; eleg. geb. M. 4.05.

Ferdinand Enke—Stuttgart. Analytische Chemie für Apotheker. Bearbeitet von Dr. Heinrich Beckurts, Professor an der herzogl. technischen Hochschule zu Braunschweig. Mit 80 Holzschnitten und zwei farbigen Tafeln. Ein Bd., pp. 466. 1896. M. 10.

Macmillan and Co.—London and New York. A Dictionary of Chemical Solubilities, Inorganic. By Arthur Messinger Comey, Ph. D., formerly Professor of Chemistry, Tufts College. 1 Vol., pp. xx, 515. 1896. $5.00.

Herdersche Verlagshandlung—Freiburg im Breisgau. Jahrbuch der Naturwissenschaften, 1895–1896. Elfter Jahrgang. Unter Mitwirkung von Fachmännern herausgegeben von Dr. Max Wildermann. Mit 61 in den Text gedruckten Abbildungen, 2 Kärtchen und einem Separatbild. Ein Bd., pp. xii, 560. 1896. $2.00.

Missouri Botanical Garden—St. Louis, Mo. Seventh Annual Report. One vol., pp. 209. 1896.

——The Sturtevant Prelinnean Library.—Reprint from the Seventh Annual Report of the Missouri Botanical Garden. Brochure, pp. 87. 1896.

Julius Springer—Berlin. Die Prüfung der Chemischen Reagentien auf Reinheit. Von Dr. C. Krauch, Chemiker in der chemischen Fabrik von E. Merck in Darmstadt. Dritte, umgeänderte und sehr vermehrte Auflage. 1 Bd., pp. v, 413. 1896. M. 9.00.

Tausch und Grosse—Halle a. S. Anleitung zur Qualitativen Analyse. Von Dr. Ernst Schmidt, Professor an der Universität Marburg. Vierte Auflage. Ein Bd., pp. 78. 1896. M. 2.50.

A. Hartleben's Verlag—Wien. Allgemeine Waarenkunde. Handbuch für Kaufleute und Gewerbetreibende. Unter Mitwirkung von Fachgenossen redigirt von Dr. Josef Bersch. 1. Lieferung: Aal—Bacallao, pp. 1—48. 1896. 30 Kr. = 50 Pf.

U. S. Dept. of Agricult.—Washington. Yearbook for 1895. One vol., pp. 656, with ten plates and numerous illustrations in the text. 1896.

Review of American Chemical Research. Brochure, pp. 395—446 of Technology Quarterly, Vol. VIII, No. 4, Dec. 1895.

Eduard Besold—Leipzig. Guide for the use of doctors and apothecaries. English-German. By Gisbert von Sudthausen. One Vol., pp. 135.

—— Sprachführer für die ärztliche und pharmaceutische Praxis. Deutsch-Englisch. Von Gisbert von Sudthausen. Ein Band, pp. 133.

Verhandlungen des X. internat. medicin. Congresses. 5 Bde. m. Reg. M. Abb. Berlin 1891—92.

Leopold Voss.—Hamburg. Anleitung zur Mikrochemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der Polytechnischen Schule zu Delft. Drittes Heft (Aromatische Amine), pp. VII, 135, mit 77 Figuren im Text. 1896. M 4.50.

U. S. Dept. of Agricult.—Washington. Contributions from the U. S. National Herbarium. Vol. III, No. 8· Flora of the Black Hills of South Dakota. By P. A. Rydberg.

Julius Springer—Berlin. Helfenberger Annalen 1895. Herausgegeben von der Chemischen Fabrik Eugen Dietrich in Helfenberg bei Dresden. Pamphlet, pp. 87. 1896.

Equitable Chemical Co.—New York City. Aseptolin. A formulated treatment for tuberculosis, septicæmia, malaria and la grippe, with reports of cases. By Cyrus Edson, M. D. Second Edition. Pamphlet, pp. 79. 1896.

Author—Des Moines. Tubercular Infectiousness of Milk. By J. Christian Bay, Bacteriologist of the Iowa State Board of Health. Reprinted from the Annual Report of the Iowa State Dairy Commission. Pamphlet, pp. 16. 1896.

Author.—Is the red Torula a genuine Saccharomyces? By J. Christian Bay. Reprint from Centralblatt für Bacteriologie etc. Leaflet, pp. 3. 1896.

Author.—Extract from Dr. Edson's new Brochure on Aseptolin. By Dr. J. B. Ransom. Pamphlet, pp. 8. 1896.

Author.—Was weiss man über Spermin? Von Dr. G. Bubis. Reprint from Therapeutische Monatshefte, 1896, Heft 1 und 2. Pamphlet, pp. 9. 1896.

Central Experimental Farm—Ottawa, Canada. Results obtained in 1895 from trial plots of important farm crops. Bulletin No. 24 Department of Agriculture. Pamphlet, pp. 28. 1896.

Author.—Eucain. Ein neues lokales Anæsthetikum. Von Zahnarzt Kiesel, Berlin. Reprint from the Zahnärztliche Rundschau 1896. Leaflet, pp. 2. 1896.

Am. Metrological Soc.—New York. The Metric System. Detailed information as to laws, practice, etc. Edited by John K. Rees, Recording Secretary. Pamphlet, pp. 24. 1896.

Chemische Fabrik von Heyden—Dresden. Die Salicylsäure als Conservirmittel für Consumartikel. Deren Werth, Nutzen und Unschädlichkeit, begründet durch das Urtheil sachkundiger Autoritäten und gerichtlicher Erkenntnisse. Pamphlet, pp. 20. 1896.

Univ. of Nebraska—Lincoln. Experiments in the Culture of the Sugar Beet in Nebraska. Bulletin No. 44 of the Agricult. Exp. Station. Pamphlet, pp. 17. 1896.

Schering & Glatz.—New York. Dr. F. von Heyden's Non-Toxic Remedies: Betanaphtol Bismuth (Orphol), Phenol-Bismuth and Tribromphenol-Bismuth (Xeroform). Pamphlet, pp. 40. 1896.

—— Eucaine Hydrochlorate. Translation from Deutsche Medicinal Zeitung. Pamphlet, pp. 12.

—— The Guaiacol-Carbonate Treatment of Typhoid Fever. By Dr. S. Fraenkel. Translation from Wiener Med. Blätter. Leaflet, pp. 4.

Fifty-second Annual Announcement of the Eclectic Medical Institute, Cincinnati, Ohio.

Second Annual Report of the Department of Physical Education, University of Wisconsin. May, 1896.

Abstract on the Report of Vivisection, adopted by the Am. Humane Ass'n. Sept. 26, 1895.

Bulletin of the New York Botanical Garden. Vol. I, No. 1. Pamphlet, pp. 21.

Reviews.

Analytische Chemie für Apotheker. Bearbeitet von Dr. Heinrich Beckurts, Professor an der Herzogl. Techn. Hochschule zu Braunschweig. Verlag von Ferdinand Enke, Stuttgart. Ein Bd., pp. IV, 466. Mit 80 Holzschnitten und 2 farbigen Tafeln. 1896. M. 10.00.

When Liebig gave his attention to and wrote about agricultural chemistry, the chemistry of his subject was uppermost in his mind. To-day the same term is sometimes used to cover work to which there is little if any chemistry. In pharmacy we, likewise, have a-b-c-books on chemistry that sail under the presumptious name of pharmaceutical etc. chemistry, or monographic treatises on chemical subjects of interest to the pharmacist, with rather poor chemistry. There is but one chemistry. It may be adapted to students who desire some general information of the natural sciences, or to those who desire to become teachers of chemistry, or analytical chemists, or pharmacists, or physicians, etc., but in order to deserve its name it should be a philosophic exposition of the science. The same might be said of analytical chemistry and its applications.

A book that introduces itself as Analytical Chemistry for Apothecaries, rather than as Pharmaceutical Analytical Chemistry, makes a favorable impression at first sight. In this particular case the good impression stays as one cuts the pages to become more familiar with the contents and methods of treatment. The author does not pretend to bring anything new that cannot be found in other text-books of analytical chemistry, but merely claims to have carefully considered the interests of the pharmaceutical student in selecting the experiments.

An enumeration of the table of contents will give the reader a good idea of the scope of the book:—

I. Reactions of inorganic substances.
II. Reactions of organic substances.
III. Course of qualitative analysis.
IV. Gravimetric analysis.
V. Volumetric analysis.
VI. Toxicological-chemical examinations.
VII. Medico-chemical examinations.
VIII. Testing and assay of drugs.
IX. Examination of foodstuffs, beverages, air, water, etc.
X. Instruments and apparatus.
XI. Tables and index.

The book is comprehensive in its scope and a faithful student with good preparation is supposed to be able to master its contents in a year and a half to two years working in the laboratory daily.

The pharmacist of to-day makes but few of his galenical preparations and probably none of his chemicals. It is, therefore, all the more important that he should be a thorough master of chemistry and chemical analysis in order that he may ascertain for himself the quality of the chemicals and preparations he purchases, and may assume personal responsibility for what he dispenses. This is the *raison d'être* of the modern pharmacist. *E. K.*

Review of American Chemical Research. Reprint from Technology Quarterly, Vol. VIII, No. 4. Edited by Arthur A. Noyes. Pamphlet, pp. 52.

American chemists have been at a disadvantage in having their literature distributed over a comparatively large number of journals, not all of which were by any means strictly chemical publications.

The Technology Quarterly during the past year published a Review of American Chemical Research. This review, prepared by members of the instructing staff of the Massachusetts Institute of Technology, will hereafter be also published as a separate volume. The abstracts are classified into the following groups:—

General and Physical Chemistry.
Inorganic Chemistry.
Analytical Chemistry.
Proximate and Technical Analysis.
Geological and Mineralogical Chemistry.
Organic Chemistry.
Technical Chemistry.
Biological Chemistry.
Metallurgical Chemistry and Assaying.
Apparatus.

The work accomplished thus far is very creditable to the editor and his associates. No doubt it will gain in completeness as it progresses and will give Europeans a much better idea of the work done on this side of the Atlantic. *E. K.*

A Dictionary of Chemical Solubilities Inorganic. By Dr. Arthur Comey, formerly Professor of Chemistry, Tufts College. Macmillan and Co., New York. One vol., pp. IX, 515. 1896. $5.00.

Among the principal literary needs of the modern chemical laboratory an up-to-date dictionary of chemical solubilities was one of the most important. The modern chemical laboratory is equipped with almost every imaginable mechanical contrivance to facilitate work. The literary facilities of such laboratories are not always equally well provided for. The Dictionary of Chemical Solubilities of inorganic substances by Prof. Comey will make good one of these deficiencies.

In the preface the author gives a brief yet interesting account of the evolution of the dictionary of solubilities. The explanatory preface gives directions for the use of the work, since, in order to use a dictionary for ready reference, it is necessary to know according to what principle the items are arranged. A list of abbreviations and references follows. The appendix contains tables of formulas for converting areometer degrees into specific gravity and a synchronistic table of chemical and other scientific periodicals.

The large body of the text is taken up by the dictionary proper. Beginning with air and ending with zirconyl sulphide the inorganic chemicals, including a small number of carbon compounds usually classed with the inorganic, are arranged in alphabetical order.

That the work previous to 1850 should have been included, even when only of historical value, is to be considered an advantage rather than a disadvantage. A monographic treatise of this kind cannot afford to omit facts that have historic value, simply because some "practical chemists" may have no use for such data.

The work appears to be thoroughly done. A sufficient variety of type has been used to make ready reference easy. The numerous tables of solubility constitute a valuable addition to the text. The character of the bookwork of the publishers is too well known to require any comment. *E. K.*

Guide for the use of doctors and apothecaries. English-German. By Gisbert von Sudthausen. Eduard Besold, Leipzig. One vol., pp. 135.

Sprachführer für die ärztliche und pharmaceutische Praxis. Deutsch-Englisch. Von Gisbert von Sudthausen. Eduard Besold, Leipzig. Ein Bd., pp. 133.

These companion volumes are intended primarily for German-English or German-American physicians and pharmacists who are not familiar with the colloquial equivalents of technical terms. They may, however, be of almost equal use to the American or English pharmacist with German-speaking patrons. The greater part of the work is made up of tables of equivalent terms, classified under such headings as The human body, Diseases, Dressings, Bandages and hospital conveyances, The city, English money, American money, Weights and measures, Medicaments, Retail articles, Surgical instruments, etc. This is followed by a brief general vocabulary of verbs and nouns most likely to be needed by the physician or apothecary, and by a dictionary of phrases arranged under conspicuous words. Tables of comparison of thermometers and of linear measure are given at the end. In every case the pronunciation of the English term is indicated in German letters.

The matter in the two volumes is practically the same, the terms in each list being arranged alphabetically, in one case according to the English, in the other according to the German. The translations are, on the whole, idiomatic and well-chosen. The regular use of "the" before all words where the article is used in German might be misleading: as, "the indigestion", "the swollen feet". Among the phrases are a few Briticisms which might amuse an American customer: as, "a nasty cough", "stopping a tooth with gold". In most cases, however, the work may be trusted implicitly.

William B. Cairns.

Jahrbuch der Naturwissenschaften 1895–1896. Enthaltend die hervorragensten Fortschritte auf den Gebieten: Physik, Chemie und chemische Technologie; angewandte Mechanik; Meteorologie und physikalische Geographie; Astronomie und mathematische Geographie; Zoologie und Botanik; Forst- und Landwirthschaft; Mineralogie und Geologie; Anthropologie, Ethnologie und Urgeschichte; Gesundheitspflege, Medizin und Physiologie; Länder- und Völkerkunde; Handel, Industrie und Verkehr. Elfter Jahrgang. Unter Mitwirkung von Fachmännern. Herausgegeben von Dr. Max Wildermann. Herdersche Verlagsbuchhandlung, Freiburg im Breisgau. Ein Bd., pp. XIII, 560. Mit 61 in den Text gedruckten Abbildungen, 2 Kärtchen und einem Separatbild. 1896. $2.00.

The title page of this volume is sufficiently complete to serve, for the purposes of review, as a table of contents. The few chapters not enumerated above are those on the 67th session of the Gesellschaft deutscher Naturforscher und Aerzte zu Lübeck (1895); a preliminary communication of the Madrid meteor; the heavens visible in central Europe; and the Totenbuch, the book of the dead.

The writer has twice (pp. 69 and 142) had occasion during this year to review pharmaceutical year-books. He pointed out that the complaint made by the publishers of one of these year-books, that so few pharmacists bought the respective year-book although the "entire professional press" recommended it, was probably due in part to the fact that it was nothing more than a catalogue of abstracts. Attention was also called to the fact that it is impossible for any one person to write a model year-book on a subject like pharmacy, which comprises such diversified branches of natural science.

Upon examination of the book before us we find that it is not compiled by one person, but that a number of persons have been entrusted with writing a year's report of that science or better those branches of science, of which they were supposed to be master. Furthermore the subject is treated in a more general manner. Abstracts on the same or similar subjects frequently have been brought under a somewhat general heading. The reader who desires to learn something about argon and helium will find a number of abstracts boiled down to a nine-page article on this interesting subject. The pharmacist desirous of learning something about the physiology and therapy of the thyroid gland will find a four-page chapter on this subject interesting and profitable reading. In this manner a large number of subjects, including even a seven-page article on bicycling, have been treated.

It becomes evident that the work is not intended for the specialist. It is not complete enough, nor does it go sufficiently into detail for his purposes. This year-book, however, seems admirably adapted to the needs of the scientific student and the professional man who desires a general information about the progress made in the natural sciences and the arts even after he has left college. The pharmacist, the physician, the highschool teacher and others are in need of just such information as is supplied by this year-book. To such as have a reading-knowledge of scientific German it can be strongly recommended.

E. K.

Medicinische Specialitäten. Eine Sammlung der meisten bis jetzt bekannten und untersuchten Geheimmittel und Specialitäten, mit Angabe ihrer Zusammensetzung nach den bewährtesten Chemikern. Von C. F. Karpaun-Karlowa. Dritte vermehrte, mit Einleitung und vollständigem Register versehene Auflage von Dr. pharm. Max von Waldheim. A. Hartleben's Verlag, Wien. Ein Bd., pp. 260, 1896. Geh. 1 fl., 80 kr., Eleg. geb., 2 fl., 25 kr.

As the author correctly says in the introduction to this work, the secret-remedy swindle is undoubtedly one of the great evils of the present day, and all possible means should be taken to better this unhealthy condition of affairs. Unfortunately, the public press, instead of co-operating with the better class of physicians and pharmacists in protecting the masses by enlightening them on this question, fosters the evil by opening its columns to the most audacious advertisements of remedies, accompanied by the often forged testimonials of patients and even physicians.

The object of books of the above kind is in part to expose the fraud of secret-remedies, so-called patent-medicines, by publishing their composition, and so showing the presence of injurious constituents, or the exorbitant prices charged for worthless material when the ingredients are harmless. With these motives the author has revised the work originally compiled by the late Capaun-Karlowa, and in its completed form gives an alphabetical list of over two thousand secret-remedies and specialties, together with their probable composition as determined by analysis. The compilation is made largely from the works of Hager and Jacobsen, the publications of the Karlsruh Board of Health, and from pharmaceutical journals. The large number of American "patent-medicines" included in the list makes the work of value to pharmacists of this country, as well as to those of Europe. The alphabetical index of names and synonyms which complete the work, enhances its value considerably as a book of reference.

Richard Fischer.

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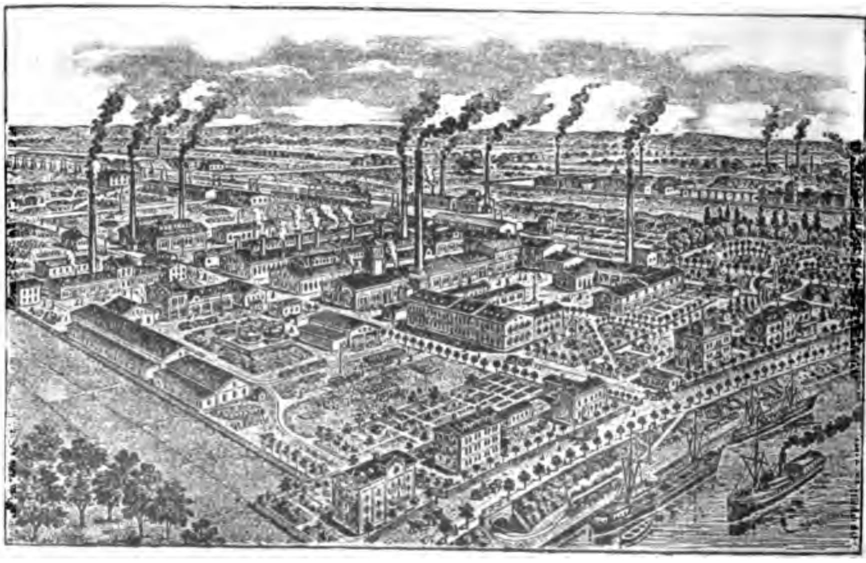

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Universities and Colleges.

Columbia University.

Dr. N. S. Britton, professor of botany in Columbia University has been appointed director of the New York Botanical Garden, and the place so made vacant has been filled by the appointment of Dr. Lucien M. Underwood, now professor of botany in Alabama Polytechnic Institute.

University of Wuerzburg.

On the 10th of May the new chemical laboratory, erected at an expense of M. 650,000, was dedicated. It is largely constructed after the plan of the Zuerich laboratory, and has all modern improvements. The auditorium has a capacity for 220 and the four large laboratories working places for 148.

Chicago College of Pharmacy.

The Chicago School of Pharmacy which has recently become the School of Pharmacy of the University of Illinois announces the opening of its thirty-seventh session upon Tuesday October 6th, 1896.

The faculty will consist of F. M. Goodman, Professor of Botany and Materia Medica, C. S. N. Hallberg, Professor of Pharmacy and Director of the Dispensing Laboratory, W. A. Puckner, Professor of Chemistry and Director of the Chemical Laboratory, F. S. Hereth, Director of the Pharmaceutical Laboratory, W. B. Day, Director of the Microscopical Laboratory, A. D. Thorburn, Instructor in Chemistry, Geo. E. Case, Instructor in Pharmacy, and L. I. Schreiner, Assistant in Microscopy.

The course will consist of two terms of twenty-eight weeks each for the degree of Graduate in Pharmacy.

University of Wisconsin.

Commencement exercises began Sunday, June 21, on the afternoon of which day President Adams delivered the baccalaureate address. His subject was The University and the State. Among the exercises on Monday the address before the School of Pharmacy by Mr. Malcolm B. Jeffris of Janesville should be mentioned. Mr. Jeffris has been counsel for the State Board since its organization and has upheld the state law in all three courts of the state.

At 9:30 Wednesday morning the commencement exercises were held in the Armory Hall of the New Gymnasium. Of the 278 graduates from the various colleges and courses 10 were from the School of Pharmacy. Three of these graduated with the degree of Bachelor of Science, in Pharmacy, from the four years' course; the other seven as Ph. G. from the two and three years' courses. More than half of the graduates had pursued more than two full collegiate years of study at the University.

Wednesday evening the annual banquet of the pharmaceutical alumni was held at the Capital House.

The new catalogues of the University of Wisconsin are now ready. They can be had upon application to either Mr. E. F. Riley, Secy., or Mr. W. D. Hiestand, Registrar.

The Wisconsin Summer School begins its ninth annual session July 6 and ends Aug. 14. Among the courses offered, attention may here be called to those in the departments of physics, chemistry, botany and physiology. For details see pp. 248—261 of the university catalogue.

St. Louis College of Pharmacy.

The following resolutions of respect, in honor of Dr. Charles O. Curtman, were passed at a recent meeting of the college:—

Resolved, That it is with deep sorrow that we record the death of Dr. Chas. O. Curtman who was for eleven years a member of this Association and who, in the chair of chemistry, was one of its most successful teachers and did much in building up the reputation of the college.

Resolved, That in him whose loss we lament we recognize one who has wielded a wide influence because of his ability and aptness in his chosen vocation; one who has done much to disseminate knowledge, awaken thought and encourage the scientific spirit.

Resolved, That we recognize with pride the work in medical and pharmaceutical chemistry which has given him an international reputation and which we, as fellow citizens of St. Louis, in a small measure share with him.

Resolved, That while the industry, patience and thoroughness with which he has pursued his investigations in many branches of science has challenged our admiration we also bear testimony to the many good personal qualities which have attached him to us as a friend.

Resolved, That these resolutions be spread upon the records of the College, be furnished the pharmaceutical press for publication and that an engrossed copy be transmitted to the family.

Chas. Gietner, Pres.
J. B. Falk, Sec'y.

Paris Superior School of Pharmacy.

M. Planchon, in his annual official report on the Paris Superior School of Pharmacy for the scholastic year 1894-95, states that the total number of students is 1802, or 86 more than during the preceding twelve months. Far, however, from expressing satisfaction at the increasing number of students, M. Planchon points out that the work of the school is considerably hindered by the want of space, especially in the laboratories for practical work. He approves the principle of equipping provincial schools as completely as the Parisian, so as to prevent an undue influx of provincials to the metropolis; and he expresses a hope that when the "too lengthily elaborated" Pharmacy Act becomes law, the second-class pharmacists' degree will be abolished, which will enable him to "still further raise the scientific status of the school." It may be remarked that the percentage of students for the second-class diploma continually decreases; over two-thirds of the students now inscribe themselves for the first-class degree.

Unlike the School of Medicine, where lady-students and foreigners are so numerous (there are three English and 151 Russian lady-students, also 193 Russians and 15 Englishmen there) the foreign element at the School of Pharmacy is but small. Of the twenty-seven born outside France, eight are Turks and four Russians (including one lady.) There are no English subjects; and the French lady-students do not number half a dozen. Diplomas were granted to 144 first-class and 34 second-class pharmacists, while two pharmacists obtained the "diplome supérieur." The superior diploma was founded in 1878 and is equivalent to a doctorate. It qualifies its possessors for professorship in the Superior School of Pharmacy or for the chair of pharmaceutical sciences in mixed faculties.

Besides these, 111 herborists presented themselves for examination, to 75 of whom certificates were granted. M. Planchon regrets to observe that the diminution in these recently noted was only temporary, and that these "too numerous" practitioners still carry on a "clandestine competition" with the qualified pharmacist. "The hour has come" he considers, "to cut out the evil by the roots."

Scientific Societies.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Colorado	July 14	Denver	J. Kochran, Denver.
Illinois	July 28	Springfield	F. Fleury, Springfield.
Iowa	July 15	Clear Lake	A. H. Miles, Des Moines.
North Dakota	July 28	Fargo	W. S. Parker, Lisbon.
Rhode Island	July 8	Providence	Wm. B. Cates, Providence.
South Dakota	July 28	Lake Madison	I. A. Keith, Lake Preston.
Tennessee	July 15	Crawfish Springs	R. W. Vickers, Murfreesboro.
Virginia	July 16	Blue Ridge Springs	C. B. Fleet, Lynchburg.

American Association for the Advancement of Science.

The local committee of the A^{3}S has sent out its preliminary announcement of the forty-fifth meeting of the American Association for the Advancement of Science to be held in Buffalo, N. Y., Aug. 22nd to 29th. The pamphlet includes a preliminary announcement of the meetings of several affiliated scientific societies that will hold their sessions in Buffalo, Aug. 19th, 22nd, and Aug. 31st to Sept. 2nd.

National Eclectic Medical Association.

The National Eclectic Medical Association has issued a handsome Souvenir of the 26th annual meeting which was held at Portland, Oregon, June 16—18, of this year. A very tempting trip is outlined for those who could attend.

Arkansas Pharmaceutical Association.

The 14th annual meeting was held at Little Rock, May 12th, 13th and 14th. An unusually good attendance and a good meeting is reported. The next meeting will be held at the same place on the second Tuesday of May 1897. The officers elected were as follows: Prest., J. M. Sparks, Fort Smith; 1st V. P., F. G. Kerr, Van Buren; 2nd V. P., J. B. Aichart, Lonoke; Secty., John B. Bond Jr., Little Rock; Treas., Jno. A. Jungkirch, Little Rock.

Minnesota Pharmaceutical Association.

The principal feature of the meeting at Lake Minnetonka last month was an address by Prof. A. B. Prescott of Ann Arbor, Mich., on "The function of pharmacy in the social body, its responsibilities to the public and to the physician." An abstract of this addresss will be found on p. 159 of this number.

Missouri Pharmaceutical Association.

The eighteenth annual meeting was held at Excelsior Springs, June 9, 10, 11 and 12. Among the papers read the following of scientific interest may be mentioned:

Process for the preparation of spirit of nitrous ether, with practical demonstration, by Prof. David Walker of Kansas City.

Problems in organic chemistry, by Prof. J. M. Good of St. Louis.

Methods of detecting drug adulterations, with illustrations, by Prof. Francis Hemm of St. Louis.

A new method of preserving fruits and flowers, by John Wright of Indianapolis.

The following officers were elected: President, Eugene Soper, St. Joseph; First Vice-President, F. W. Sennewald, St. Louis; Second Vice-President, Dr. D. K. Morton, Missouri City; Third Vice-President, W. R. Scheldrup, Pierce City; Secretary, Dr. H. M. Whelpley, St. Louis; Treasurer, William Mittelbach, Boonville; Assistant Secretary, Ambrose Mueller, St. Louis; Local Secretary, Thomas Layton, St. Louis; Members of the Council: J. M. Good of St. Louis, J. M. Love of Kansas City, R. E. Maupin of Pattonsburg, C. E. Corcoran of Kansas City, and Miss Fredrica De Wyl of Jefferson City.

State Boards of Pharmacy.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Illinois	Springfield	July 30	Frank Fleury, Springfield.
Minnesota	Minneapolis	July 7	H. G. Webster, Minneapolis.
Missouri	Sedalia	July 6	F. W. Sennewald, St. Louis.
N. Carolina	Morehead	July 21	W. Simpson, Raleigh.
Ohio	Toledo	July 14	W. R. Ogier, Columbus.
Oklahoma	Oklahoma Cy	July 7	B. B. Howendobler Perry.
S. Carolina	Charleston	July 18	H. W. Hummel, Charleston.
Tennessee	Nashville	July 14	J. O. Burge, Nashville

Wisconsin State Board.

The Board at its June meeting in Madison examined 34 candidates, of whom 16 were rejected. The names of the successful candidates are:

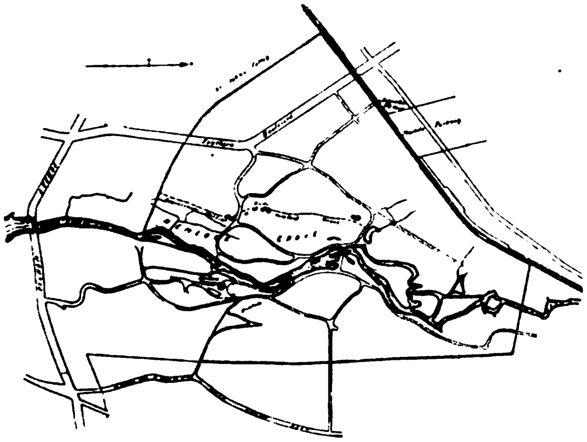
Licentiates: — Laura M. Jones, Madison; H. J. Kamps, Marshfield; C. H. Henton, Otsego; Libbie Higgins, Eagle River; E. W. Meinecke, Milwaukee; E. F. Freytag, Milwaukee; O. C. Stockmeyer, Two Rivers; J. W. Palmer, Sparta; F. C. O. Muenich, Lancaster.

Assistants: — W. R. Schuman, Prairie du Chien. G. W. Otto, and E. Bressler, Milwaukee; A. E. Godfery, Whitewater; G. E. Bilstad, Cambridge; E. B. Duncan, Baraboo; H. L. Holderness, Kenosha.

Botanical Gardens.

New York Botanical Garden.

This infant corporation is not only established on a financial basis that assures future success — over $250,000 subscription and $500,000 of City Bonds, — but has already begun work on the park itself. A tract of 250 acres of Bronx Park has been turned over by the Park Commission to the Board of Directors of the Garden. A topographic map of 50 ft. to the inch and five foot contours has been made to serve as the basis for future work. Any one acquainted with the nature of upper New York north of the Harlem River can, aided by a glance at the accompanying map, form a fair idea of the nature of the grounds. That part of the Park, called Hemlock Grove is to remain as far as practicable in its present condition. Plans for building a Museum and Herbarium, and an Horticultural Building have already been submitted to the Board.



The labeling of about forty species of trees on the ground was begun last fall, a temporary nursery was started, and $5,000 of plants have been promised by a New York gardener. Columbia College is going to co-operate with the Garden. It will place its herbarium and library in the new fire proof building when completed and will in return enjoy the educational facilities of the Garden, particularly for graduate instruction in botany. The J. B. Ellis, (Newfield, N. J.) herbarium of some 75,000 specimens of fungi together with the accompanying library has been purchased. Besides this a course of lectures, in co-operation with the American Museum of Natural History, inaugurated by Dr. D. Morris, Assistant Director of the Royal Gardens at Kew, England, has been begun. No. 1 of Vol. 1 of the Bulletin of the New York Botanical Garden was issued in April of this year. It contains an account of the progress of the garden.

Bibliography.

The editor of the Technology Quarterly, Massachusetts Institute of Technology, Boston, announces that the Review of Am. Chem. Research will this year be issued also in the form of separate reprints from the journal. The reprints will, like the journal, be issued quarterly and will be repaged and provided at the close of the year with title page and index, thus making the Review a volume complete in itself. The price of subscription is $1.50 per annum.

Fr. Eugen Koehler of Gera-Untermhaus* is now publishing a supplementary volume to the two volumes of Medicinalpflanzen which appeared in the years from 1883—1890. The first fascicle of the new undertaking, published under the title of Koehler's Neueste und wichtigste Medicinal-Pflanzen in naturgetreuen Abbildungen mit kurz erklärendem Texte, contains four colored plates with text. Fascicles two and three are soon to appear. The volume is to be complete in about 15 fascicles.

Macmillan & Co. will publish immediately an entirely new edition of the The Nursery Book, thoroughly recast and revised by the author, Professor S. H. Bailey, of Cornell University.

The same publishers also announce for early publication vol. I. of the Columbia University Botanical Series, entitled Elementary Botany; by Dr. Carlton C. Curtis, tutor in botany, Columbia University.

The June number of the Bulletin of the Am. Acad. of Med. (Eaton, Pa.) contains in addition to the proceedings of the Am. Acad. of Med., the Assoc. of Am. Med. Colleges, and Confederation of State Med. Examiners, Dr. George M. Goulds' address on Vivisection.

The Columbine Leaflet issued by The Columbine Association contains an abstract of several articles by F. Le Roy Sargent, in which the writer presents his arguments why the columbine should be our national flower. The leaflet can be had (at three cents each) upon application to Mr. J. S. Pray, Secy., P. O. Box 2774, Boston, Mass.,

Gebrueder Borntraeger, Berlin, Germany, announce the publication of the German edition by Dr. Emil Knoblauch of Dr. Eugenius Warmig's Lehrbuch der bekologischen Pflanzengeographie, eine Einführung in die Kenntniss der Pflanzenvereine.

Heft IV. of H. Behrens' Anleitung zur mikrochemischen Analyse, the third fascicle of which has just appeared, may be expected some time during the summer of this year. It is to contain the carbamines, aliphatic and aromatic acids. For contents of fascicle three and publishers see p. 166 of this number.

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* Geo. Brumder, Milwaukee, Wis., agent.

An international archive for the history of medicine and medical geography is to be published in Amsterdam under the title of "Janus". So far there exists no journal of this kind in Europe. It is to be truly international and papers can be published in the German, English or French language. A large commercial corporation has promised financial support. Secretary of the new undertaking is Dr. H. F. A. Peijpers in Amsterdam (Parkweg), Holland.

The Graduate Courses for 1896—'97, offered by twenty-three of our leading colleges and universities, is now ready. Leach, Shewell & Sanborn are the publishers.

Felix Alcan, of Paris, announces as one of his new publications the sixth edition of the Dictionaire de Médicine, par les Drs. E. Bouchert et A. Derprés.

It is stated that the fourth edition of the Mexican Pharmacopœia is to appear soon. The first was published in 1846, the second in 1874, the third in 1884 and a supplement in 1890.

In No. 13 of vol. 45 of Die Natur (G. Schwetschke" scher Verlag, Hall und Saale) Dr. Karl Mueller, one of the founders and for forty-five years editor of that journal, bids farewell to his readers in a very interesting article on "The Philosophy of Nature." The next number contains an introductory note by Dr. Otto Taschenberg, the new editor. The April number, like its precursors, is replete with interest to the student of nature. Of papers which are of more or less technical value to the pharmacists several might be mentioned:—

Dr. G. Baumert.—Aus dem Gebiete der Nahrungsmittel-Chemie:

I. Einiges über Fleisch und Fleischwaren;

II. Ueber Milch und ihre Verfälschung.

Prof. Georg Kraus.—Warum der Botaniker in die Tropen muss.

Prof. W. Zopf.—Ueber den Nutzen der Flechten.

With the view of increasing the distribution of the annual reports of the proceedings of the association and to enable the members to complete their sets at very low figures, the committee on publication of the American Pharmaceutical Association has been authorized to offer a reduction of fifty percent on the price of all proceedings published prior to 1891. The schedule of reduced prices may be found on page XXVII of volume 43 for 1895. The reports for 1856 and 1859 are out of print and none were published in 1861.

All orders for books should be addressed to Chas. Caspari Jr., Permanent Secretary, 109 Aisquith St., Baltimore, Md.

Catalogues Received:

Félix Alcan, Paris: Hygiène—Médicine et Chirurgie.

Lemcke & Buechner, New York: Monthly Bulletin of World Literature.

Mayer & Mueller, Berlin: Wegweiser durch die Litteratur der chemischen Technologie.

Ludwig Rosenthal's Antiquariat, Muenchen.
Katalog 93: Alte Medicin bis zum Jahre 1799.
Katalog 94: Medicin seit dem Jahre 1800.

Commercial.

Sicilian Sulphur Industry.

A Reuter's telegram from Rome says that one of the chief questions now engaging the attention of the Italian Cabinet is that of the emelioration of the sulphur industry of Sicily which is at present in a very depressed condition, owing to the competition of pyrites for the production of sulphuric acid, and the fact of the supply now largely exceeding the demand, not to mention the threatened rivalry of Japanese sulphur. The price has fallen from 140 lire to 60 lire per ton. It is now proposed to abolish the export duty of 20 percent, which formerly yielded an annual revenue of 3,400,000 lire. In order to make good the deficit thus caused to the revenue, it is proposed to levy a tax of 1 lira per ton on sulphur exported from Sicily, to increase the imported duty on barley and white maize from 1.15 lira to 4 lire, and to introduce a statistical fee ranging from 10 centimes per quintal to 10 centimes per ton on imported goods not specified in the treatise of commerce.

Price Lists Received.

Preis-Liste der Droguen-Handlung G. & R. Fritz, Wien, pp. 224, Jan. 1896.

Vorzugs-Preis der Medicinal-Droguen-Handlung en gros G. & R. Fritz, Wien, pp. 56, Mitte Mai, 1896.

Preis-Liste von Pezoldt & Suess in Wien, with Mentor für die Namen neuerer Arzneimittel. pp. 196, Jan. 1896.

Sharp and Dohme, Baltimore, Md.

Dr. Theodore Schuchardt, Goerlitz, May, 1896.

Vereinigte Chininfabriken, Zimmer & Co., Frankfurt a. M., Mai, 1886.

Gehe & Co. of Dresden announce as a novelty the introduction into the market of ethyl chloride in metal flasks. A mixture of ethyl chloride with the lower boiling methyl chloride is brought into the market in similar flasks under the name of *anestile*.

Of 70 drugs examined by the State Board of Health of Massachusetts during the week ending May 9th, 48 were found of good quality and 22 were adulterated or varied from the legal standard.

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For clerks or vacant positions in Wisconsin drug-stores apply to Wisconsin Druggists Exchange, E. B. Heimstreet, Janesville.

B. Herder, bookseller, publisher and importer, whose principal depot is in Freiburg, Baden (established in 1801) has a branch office in St. Louis, Mo.

Ferdinand Enke of Stuttgart has begun to publish Sammlung chemischer und chemisch-technischer Vorträge under the editorship of Prof. Felix B. Ahrens.

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Midy's Capsules of Santal.
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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 9. **SEPTEMBER, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An illustrated Monthly Journal.

Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 9. SEPTEMBER, 1896.

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

American Pharmaceutical Association.

> "From whatsoever state ye come,
> Welcome, thrice welcome, all."

For the second time in the history of the organization the American Pharmaceutical Association, true to its name, went to the north of our boundary line and met in Canada. The people of the United States are apt to consider their country as being synonymous with America, so the name American Pharmaceutical Association is as a rule thought of as being synonymous with United States Pharmaceutical Association. The meeting at Montreal fitly demonstrated that science and even professional interests in America know no more about national boundary lines than they know about lines more or less arbitrarily drawn between the various states and territories of the United States. It may truely be asserted that the members from the "States" hardly realized that they had gone into another country. The fact that Canadian-French was freely spoken in the streets of Montreal created no more surprise than to hear Low-German in the streets of Milwaukee, French in New Orleans or Spanish in the cities of the Mexican frontier. So little were the members from the United States aware that they had left their republic and had entered a country with a monarchial form of government that the refusal of United States silver by the street-car conductors or the motion of some member including "all the states", but omitting the provinces occasionally reminded them that Uncle Sam after all does not own the entire American continent. The stay at Montreal was most delightful in every respect, and in the due course of rotation the association will certainly be glad to receive another invitation from one of Her Majesty's provinces to the north of our boundary. Our pharmaceutical brethren of the Province of Quebec have demonstrated that we are not only one in science and professional aspirations, but that whatever language we may speak or whatever our religious beliefs may be, whether living in a republic or a royal colony, at heart we are really one people. Such an object-lesson is truly elevating at a time when Europe with her standing armies is constantly in dread of war and within half a year after our own political papers were full of war-talk with our nearest relatives beyond the sea.

In a similar manner the meetings of the association are a means for education wherever they are held. Different views held by men in widely separated sections of our own country are brought up for discussion. The American is fortunately so constituted that he does not regard as a personal enemy every one who begs to differ from him in scientific, educational or other matters. Personal contact with persons of different views is of greater importance to the members of our association than the mere listening to papers that are read, no matter how valuable they may be.

Possibly a dozen pharmaceutical journals were represented at Montreal, and almost as many will "report" the meeting. It seems highly probable that little more will be done, certainly not by most of them.

The value that comes from reading a paper before a scientific body lies largely in the discussion that follows. The association is not only to benefit by the presentation of new facts, or of new conclusions drawn from known facts, but the writer himself is to receive the benefit of friendly criticism. The fact that criticism has largely degraded to flattery or flagrant abuse is no reason why reasonable criticism should be discarded. If this is true of papers presented before scientific organizations, it is even more largely true of the meetings of such societies themselves. Rather than to "report" the Montreal meeting the Review hopes that the discussion of the character of the sessions may not prove altogether valueless, particularly if the criticism is offered in a truly friendly though earnest spirit.

It has recently been said that what "literary production needs in this country now, more than in any other, is criticism — cool, discriminating, relentless criticism", and that it cannot be construed even as flattery to judge it by a provincial standard. It would be mean praise indeed to state that the American Pharmaceutical Association compares favorably with state pharmaceutical organizations; that the absence of "Kirmis"-attractions from its meetings speaks well for the high standard of pharmacy as represented by our national, or more correctly speaking, by our international organization. Our standard must be the highest standard attained by similar organizations, not only of America, but of the civilized world. If we fall short of this standard we should not court vulgar popularity by saying "the American Pharmaceutical Association is good enough for me", but should earnestly endeavor to improve any shortcomings.

Neither should the falling short from the highest attainable standard discourage us, or cause us to shrug our shoulders at the mere mention of the A. Ph. A. and stay away from its meetings. If we do not take sufficient pride in American pharmacy to put our shoulder to the wheel, when the application of even a little energy will cause it to move in the right direction, we are no more true patriots than he who thinks patriotism consists not only in praising everything that may be construed American, but in finding faultless everything said and done by those who, on account of mere legal citizenship, claim to be Americans.

The American Pharmaceutical Association, on the whole, has a record of which it certainly need not be ashamed. It, no doubt, has been a most valuable institution bent on the progress of American pharmacy. Unfortunately, however, with the popular American idea of greatness some members have confounded numbers with character, quantity with quality. In the opinion of some the ideal American Pharmaceutical Association should include every druggist of this land; and, we have reason to fear, that if the movement had become more popular and the druggists of America had been more willing to join, the line would not even have been drawn at the twenty-five percent of Massachusetts rum-druggists, who fortunately no longer disgrace our calling in that state.

The same is true of papers presented at the meetings of various sections. We have had chairmen who boasted of having secured the largest number of papers for their section, even if these consisted merely of answers to queries, some of which were written twelve or twenty-four hours before the meeting at which unfortunately they were read.

If the individuals went begging the association went begging also, for these individuals as officers were the duly elected or appointed representatives of the association. The result of such tactics during the past years has been that even positions in the gift of the association or its sections seem to have gone begging also. Older members, who most keenly feel the stigma of reproach, and who are as just as they are broad and liberal in their views, and equally longsuffering, have not only come to the conclusion that in reality the association has itself to blame very largely, but that by all means an end must be put to anything and everything that tends to depreciate the character and dignity of an international organization composed of scientific and professional men. The thing to do for each and everyone is to give his earnest support to every detail of association activity and to exclude that which is unbecoming and improper by simply doing that which is right and insisting that only that be done.

The **General Sessions** of the association were not characterized by any extraordinary act. President Good, in his address, called attention to the fact, that while the bill requesting the use of the metric system in all governmental transactions did not become a law, yet we came nearer being successful than ever before. The negative result should, therefore, not discourage us; but rather encourage to renewed activity under more favorable circumstances, while the work of education should go on uninterruptedly.

Another matter of importance, to which attention was called in the president's address, was the introduction into the U. S. Pharmacopœia of patented chemicals used as medicinal agents as suggested a few months ago by Dr. Chas. Rice, chairman of the U. S. P. Revision Committee. There are still several years before the meeting of the next Pharmacopœial Congress, thus leaving sufficient time for a thorough discussion of the entire matter. The patenting of a process for the manufacture of any chemical is not only legitimate, but perfectly ethical, whether the product may or may not be used medicinally. The injustice lies not in the patent *per se*, but in the monstrosity known as the United States patent law, which enables the patenting not only of process, but of product as well. Many American druggists hate the European manufacturer and everything pertaining to him because in our "free" country our laws give away rights and privileges, which the foreigner could not buy in his own country. The open highway robbery is possible only because it is sanctioned by our own government. If our vicious patent laws could first be righted American pharmacists would look at the subject of the introduction of patented chemicals into the pharmacopœia with entirely different eyes.

The principal work of the association was, as usual, accomplished in the various sections. The absence of matters of immediate vital importance in the general sessions made this all the more apparent. This being the case, it is unfortunate that the sections should in any way or manner be hampered in their important work. The work of the council, of the general sessions and of the sessions of sections should not be permitted to interfere with each other as was not infrequently the case. No doubt, it is difficult to fix responsibility; but members, who talk unnecessarily, as well as officers who are late in calling meetings to order, should remember that one part of the association cannot carry out its programme to greatest advantage, if another part is permitted to dispose of time already allotted.

Of the two meetings allotted to the **Commercial Section** only one was held. When the audience of this section is in no small part made up of representatives of the press and of college professors, the time for reflection as to the vitality of this section certainly must be considered ripe. As one of the oldest members of the association remarked, the American Pharmaceutical Association was organized by the retail druggists of this country for the retail druggist. We may or may not be of the opinion that it was a good thing for the association to have outgrown this rather narrow sphere of activity, yet the same gentleman also went on record with the statement that he "had no use for the Commercial Section" and that he would "like to see it abandoned." When it was suggested that time might be gained by having the meetings of the Commercial and Scientific Sections at the same time, attention was called to the fact that this would not do because the Commercial Section "needed careful watching."

Such remarks certainly do not redound to the credit of this section. The fact is that the druggists of this country are becoming distrustful of the efficacy of commercial remedies for their ills. To a list of queries sent out by the chairman of this section he received only a very limited number of answers, and of these the serio-comical ones constituted the most appreciated portion of his address. Besides this address only a single paper was read before this section. Committees also, apparently at least, did not have much if anything to report. Yet the meeting, spiced by witticisms and retorts, disposed of an afternoon and the section perpetuated itself by the election of officers and the appointment of new committees. The evening session, fortunately in this case, was renounced, giving members of the association an opportunity to witness the brilliant *fête nuit* at Boucherville some ten miles down the St. Lawrence.

Although the number of papers presented to the **Scientific Section** was by no means frightfully large, yet the three sessions of this section were without doubt the best of the Montreal meeting. Curtailed somewhat as to time, business had to be crowded during the last session. Nevertheless, everything went off smoothly. In fact, the expeditious and pleasant manner with which the business of this section was conducted by the chairman was truly a matter of congratulation.

In his brief address the chairman emphasized the fact that it was not only a privilege and a duty of the pharmacist to be a scientist, but that it was his birthright. If he chooses to relinquish this birthright he will have only himself to blame for the consequences.

The committee on indicators for the titration of alkaloids made an extensive report, and as the same committee was reappointed and has enlisted in its service a number of volunteers, valuable results may be looked for in the field of alkaloidal assay of drugs.

The committee on special research made a report on what little it had been able to accomplish. Yet the committee was deemed of sufficient importance to be reorganized on a better basis and a large volume of work was referred to it.

If a section has not only the power to attract to itself the younger scientific element that has entered the ranks of our profession in comparatively recent years, but draws back to its meetings veterans in scientific pharmacy like Prof. Prescott it certainly seems to have a new lease for life. For a number of years many of the older and better scientists seemed to hold themselves aloof from the meetings of the association and the Scientific Section, like other sections, went begging for papers.

As already indicated, the number of papers presented was not very large, yet there were a fair number of scientifically valuable papers. It is of interest to note that the two papers embodying possibly the largest number of positive results were made possible by privately endowed fellowships in connection with two "smaller" state universities of the Northwest, who, according to a rabid paper presented in another section, are trying to attract students by lowering the standard of pharmacy.

Another paper of considerable interest was a preliminary report by the chairman on the destructive distillation of linseed oil resulting in the formation of paraffin hydrocarbons from the mixture of which illuminating oils and slack paraffin had been separated. These results are not only of practical interest, but even more so theoretically, because they help to explode one-sided views with regard to the formation of natural petroleum.

A number of other papers that were of special interest and called for questions or evoked discussions were read. Two of direct practical value were those of Mr. Alpers on Gelatine capsules with demonstrations as to the use of a newly devised capsule filling machine by the author; and of Prof. Caspari on Alcohol as a source of error in the titration of alkaloids and alkaloidal residues.

Of the three sessions scheduled for the **Section on Education and Legislation** only two were held. Unfortunately it cannot be said that the business of this section was conducted in a satisfactory manner. Whatever may be said about individual or collective responsibility as to the character of a section, it is to be hoped that the demonstrations of this year may serve as a lesson, making a repetition of such scenes as were witnessed on Saturday afternoon and evening an impossibility.

The redeeming feature of these two sessions consisted in the reports and papers of the secretary. Prof. Beal deserves the thanks of the section for the large amount of work done by him, and it is to be hoped that he will be made chairman of the committee which is requested to prepare a preliminary draft for a model pharmacy law to be submitted to this section next year. That good humor finds a place in and is duely appreciated by this section was demonstrated by a paper of the secretary in which he threw some side-lights on present pharmacy laws.

The ghost of "practical experience before graduation" was revived by but one paper, which was of such rabid character that it evoked but a solitary remark and that a denunciatory one. Nothing can do more to bury the dead than such papers inspired by ignorance. The advocates, who relegate so-called "practical experience" to the drug stores and state-boards, and who claim that universities and colleges are educational institutions and that only, can well afford to remain quiet when such onslaughts are made.

The **Social Programme** arranged by the local committee was of the highest order and more than one feature will be long remembered by those who were participants. Among the numbers of the programme the extemporized trip to Boucherville to witness the brilliant festival of the rowing club and the shooting of the Lachine Rapids were no doubt the most interesting. The car-ride on Friday afternoon through the city and its suburbs, trips of individuals and of smaller parties to Mount Royal, to the Market on Friday morning, and visits to the magnificent churches etc. made pleasant breaks into the official programme of the association. Members of the association will not only take home as souvenirs the pretty badge emblematic of our northern neighbor, but will carry with them more durable mental souvenirs that will outlast wear and tear in the every-day toil of commercial and professional activity. While we look back with pleasure to our gathering at Montreal, let us look forward with the anticipation of an equally pleasant and profitable meeting at Lake Minnetonka in '97. *E. K.*

ORIGINAL CONTRIBUTIONS.

Estimation of Hydrocyanic Acid in Bitter Almond Oil.

By *Edward Kremers* and *O. L. Schreiner.*

(Report of *Research Committee G,* U. S. P. Revision.)

The estimation of hydrocyanic acid in bitter almond oil is of great importance since the value of this oil as a medicinal agent depends possibly entirely upon the quantity of hydrocyanic acid present. The estimation may be accomplished either by volumetric or gravimetric methods. The best gravimetric method consists in adding to an aqueous solution of the oil some silver nitrate solution and then ammonia in excess, immediately acidifying again with nitric acid. The precipitate of silver cyanide so produced contains all of the hydrocyanic acid that was present, whereas the amount of silver cyanide obtained without this treatment with ammonia represents only a part of the hydrocyanic acid. This is due to the fact that the hydrocyanic acid exists for the most part in the form of benzal-cyanhydrin, $C_6H_5.CH(OH).CN$, and is therefore not capable of uniting with the silver to form cyanide until the compound is broken up by ammonia. The volumetric method generally used in the estimation of bitter almond water is the well known one of Liebig, but the results obtained are always a little higher than those obtained by the gravimetric method. This is due to the fact that bitter almond water contains but a relatively small amount of hydrocyanic acid in a large volume of water and hence the first formation of a precipitate is not readily recognized unless the solution be perfectly clear. For this reason Rieckher[1] and also Souchay[2] prefer the gravimetric method, because this can be used with any bitter almond water; whereas Liebig's method is applicable only to perfectly clear samples, which can, however, be but seldom obtained.

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[1] Neues Jahrb. d. Phar., 18, p. 1.

[2] Ztsch. f. Anal. Chem., 2, p. 173.

Vielhaber[3] estimated the amount of hydrocyanic acid in bitter almond water by adding to a weighed or measured quantity of the water magnesium hydrate suspended in water, and then titrating this opaque mixture with $\frac{N}{10}$ silver nitrate solution, using potassium chromate as indicator. The results agree very well with those obtained by the gravimetric method and the end reaction is as readily determined as is that in the analogous chlorine estimation.

It was thought that Vielhabers's method might be applicable to the direct volumetric estimation of the hydrocyanic acid in the oil. While the gravimetric estimation is very satisfactory, yet it is a decided advantage to have a volumetric method by which the oil can be more quickly estimated by the pharmacist. Experiments made with a sample of genuine bitter almond oil have shown the method to be applicable and satisfactory. It was found to be unnecessary to add the oil to a quantity of water sufficiently large to effect solution, but that a very small amount of water will do, thus increasing the accuracy of determining the end reaction. Determinations made with a large volume of water and the magnesia mixture always gave higher results, because several drops of the silver solution had to be added in excess before the red tint could be unmistakably recognized. By working in a small volume of liquid the end reaction could be determined with much greater accuracy. The details of the method are as follows:

1 gram of the oil is weighed off very accurately in a small Erlenmeyer flask. To it 10 c.c. of a mixture of magnesium hydrate with water and a few drops of potassium chromate solution are added. The titration with $\frac{N}{10}$ silver nitrate solution is then effected very slowly until the red chromate of silver formed indicates the end of the reaction, the mixture being continually agitated so as to bring the oil into intimate contact with the solution. From the amount of silver solution required the hydrocyanic acid may be readily calculated. Every c.c. of $\frac{N}{10}$ silver nitrate solution corresponds to 0.0027 gram hydrocyanic acid.

Commercial samples of bitter almond oil were obtained but not one of them contained even a trace of hydrocyanic acid. These oils had been obtained through wholesale houses of good standing as pure oils at prices varying from $4.50 to $6.00 per pound. That the oils were not those specified as "free from hydrocyanic acid" is shown by the presence of chlorinated compounds, which brand them as artificial oils or commercial benzaldehyde. The artificial benzaldehyde of commerce, which is prepared from benzal chloride, $C_6H_5.CHCl_2$, as a rule is more or less impure from the presence of chlorinated compounds, which give to the oil a pungent, repulsive odor and highly unpleasant taste, and thus alter the oil in such a manner as to make it entirely unfit for the preparation of perfumery or liquors. In estimating the purity of such oils it is therefore only necessary to restrict oneself to the detection of organic chlorine compounds. This is readily accomplished by the so-called "combustion method" given in the U. S. P.

The chlorine may be present as mono- or di-substitution products of benzaldehyde and benzyl alcohol or as benzyl chloride etc. The presence of these chlorinated products may be detected by the following method given in Schimmel & Co.'s Bericht, April 1891.

A small quantity of the oil to be examined is oxidized with a warm alkaline solution of potassium permanganate, any excess of the latter being decomposed by the addition of a few drops of alcohol. The mixture is filtered and the filtrate acidified with pure, dilute sulphuric acid. Upon cooling, the separated benzoic acid — which contains the chlorine substitution products of the benzene ring in the form of chlorinated benzoic acid — is thrown on a filter and carefully washed. The benzoic acid is dissolved in pure potash solution, a little nitre added, the solution evaporated to dryness and finally heated in a platinum dish. The incinerated residue is dissolved in water, the solution acidified with nitric acid, filtered and tested for chlorine by silver nitrate.

Alkyl chlorides may be detected as follows:

5 to 10 grams of the oil are heated to boiling in a distilling flask and the first 10 to 12 drops of the distillate are caught in 5 percent alcoholic potash. The alcoholic liquid is heated for a time in a flask connected with a reflux condenser. The alcohol is then volatilized, the residue treated with water, and the oily constituents (benzyl alcohol, etc.) removed by shaking out with ether. The aqueous liquid is warmed for a short time in a dish, acidified with nitric acid, filtered when perfectly cool from the separated benzoic acid and the filtrate tested for chlorine.

These methods can, with slight modifications, be used for the quantitative estimation of the respective chlorine compounds; but this is seldom if ever necessary.

All the samples of bitter almond oil examined, with the exception of the cabinet specimen of genuine oil, contained large quantities of benzoic acid, which crystallized out when the oils were subjected to a temperature lower than that of the room, showing the oil to be nearly saturated with benzoic acid. This tendency of bitter almond oil to become oxidized is highly objectionable to the consumer, inasmuch as such changed oils are of minor value to the perfumer or cordial maker. This change shows itself by the formation of small crystals in the upper part of partly filled bottles which, becoming larger, sink to the bottom until finally the oil is changed to a crystalline mass of benzoic acid. This was the condition in which the so-called bitter almond oil was found in several stores where inquiry was made. The oxidation is much more rapid in the case of the artificial oils. These consist, aside from the chlorinated impurities, simply of benzaldehyde and are therefore very prone to oxidation, whereas in the natural oil the aldehyde group is largely replaced by the cyanhydrin group, which is not so susceptible to atmospheric oxygen. The oxidation may be avoided by keeping the oil in bottles filled to the neck and carefully closed; but this cannot always be carried out in practice. Schimmel & Co.[4] found that the addition of 10 p. c. of alcohol to the oil decreased its susceptibility to oxidation to a marked extent, whereas the addition of only 5 p. c. of alcohol increased the formation of benzoic acid.

Three bottles containing artificial bitter almond oil: alone and with 5 and 10 p. c. alcohol respectively, were allowed to stand under the same conditions for several weeks. A quantitative determination of the free benzoic acid formed gave the following result: for the pure benzaldehyde 12.8 p. c.; for the benzaldehyde with 5 p. c. alcohol 31.4 p. c.; but for the one containing 10 p. c. of alcohol only 1.3 p. c. It would therefore seem advisable to add 10 p. c. of alcohol to artificial bitter almond oil or natural oil "free from hydrocyanic acid". Of this mixture 11 parts must be dispensed for every 10 parts of pure oil.

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[3] Arch. d. Phar., [3], 13, p. 408.

[4] Schimmel & Co., Ber., April, 1895. Ztsch. f. Anal Chem., 3, p. 34.

In the artificial oils the amount of benzoic acid can be determined by direct titration with alkali, using phenolphthalein as indicator. The results of the examination of commercial samples of bitter almond oil are enumerated in the following table.

Samples.	Specific gravity at 20°.	Hydrocyanic acid.	U. S. P. test for chlorinated compound.	Benzoic acid in solution.	Remarks.
1.	1.067	4.45% 4.42%	Free from chlorinated compounds.	No determination.	Genuine oil.
2.	1.074	0 p. c.	Chlorine present.	17.16 p. c.	Commercial benzaldehyde. A large quantity of benzoic acid separated on cooling.
3.	1.059	0 p. c.	Chlorine present.	17.04 p. c.	Commercial benzaldehyde. About one third of the oil had solidified. The supernatant oil separated a large quantity of benzoic acid on cooling.
4.	1.057	0 p. c.	Chlorine present.	9.74 p. c.	Commercial benzaldehyde. No benzoic acid separated on cooling.
5.	1.070	0 p. c.	Chlorine present.	20.89 p. c.	Commercial benzaldehyde. This oil congealed to a solid mass of benzoic acid when cooled below 20° C. The congealing point rose in a short time to 25° C. This possibly was due to the further oxidation of the oil while in contact with the air.
6.	1.070 at 30°.	0 p. c.	Chlorine present.	20.69 p. c.	Commercial benzaldehyde. The bottle contained considerable benzoic acid in solid form. That in solution separated at temperatures below 25°.

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On the Chemical Composition of the Oil of Monarda Fistulosa (L).

By *E. J. Melzner* and *Edward Kremers*.[*]

Introduction.

A year ago a specimen of oil of Wild Bergamot was examined in this laboratory. It was found to contain about fifty percent of carvacrol. From the non-phenol constituents there were obtained cymene and an oxygenated fraction of a very high boiling point. Furthermore there was isolated a crystalline coloring matter, resembling alizerin. These investigations were reported in the Pharmaceutische Rundschau, Vol. 13, p. 207; also in the last volume of the Proceedings of the A. Ph. A. The commercial importance of the discovery of so large a quantity of carvacrol in so common a plant, is alluded to in one of the closing paragraphs. A question of physiological interest is also alluded to in the following words: "If the oils examined by previous investigators had been positively derived from *Monarda punctata*, one might be inclined to suppose that the two species *punctata* and *fistulosa*[†] produced two isomeric yet chemically distinct phenols, viz: thymol and carvacrol. Under the conditions such a conclusion would be unwarranted at present—this all the more so, if one recalls the observations made in the laboratories of Schimmel & Co., that e. g. oil of thyme sometimes contains thymol, sometimes carvacrol, or both. This question of plant physiological interest can therefore be answered only after a longer and more careful study of the oils of both species of *Monarda*. Material for this purpose is already being collected."

The material to which reference is made in the above paragraph was collected weekly, as far as possible, and was obtained largely from the same field from which the previous material had been collected. There existed, however, a marked difference in the plants. The summer of 1895 having been exceedingly dry, the plants were rather small and, on the whole, did not possess a healthy appearance. A noticeable difference in the oils also existed. Whereas the oil distilled in 1894 was dark red in color, that distilled in 1895 from the same field was on the whole of a light yellowish color. Even, in some instances, in which the oil was slightly reddish in color when freshly distilled, this color disappeared upon standing. Further details with regard to conditions of the herb and of the peculiarities of the oil obtained therefrom will be given in a subsequent table.

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[*] Report to Committee on Special Research of the Am. Pharm. Ass., presented at the Montreal Meeting.

[†] The plants from the two sources were identified by Mr. L. S. Cheney, instructor in pharmaceutical botany at the University of Wisconsin.

It is of interest to note that a quantity of oil distilled from the herb growing under more favorable conditions and collected at a point only five miles distant from the former field, was dark red with a permanent dark red color.

It is still too early to state definitely from what part of the herb this coloring matter is obtained. It was thought at first to reside in the purplish stems. It was learned, however, that the presence or absence of those stems had no effect on the color of the oil. It may be worth mentioning in this connection that the yellowish oil was obtained from plants devoid of flowers, also with such in full blossom, but poorly developed seeds. On the other hand, dark red oil was obtained from plants in full blossom, in which the seed, that had already formed, seemed normally developed. It is too early, however, to attribute the coloring to the normally developed seeds. Possibly there is no relation between the two; the poorly developed seeds and the absence of volatile coloring matter being both due to the excessive drought. This subject, like other subjects pertaining to this oil, will be further investigated.

Experimental Part.

Inasmuch as the various specimens of the oils have been obtained at different intervals during the summer and early fall, it was of considerable interest to ascertain if the phenol constituent of these oils varied to any extent. Phenol determinations were therefore made of each separate specimen.

The following table contains an enumeration of the oils obtained from plants collected near Chandler Street at different times during the months June, July, August and September; also statements with reference to the parts of plants used, specific gravity and rotatory power of oil as well as the results of a crude phenol estimation.

No.	Date of Collection.	Description of Oil.	Part of Plants used.	Sp. gr., determined shortly after dist.	Sp. gr. redetermined in Jan. '96.	Rotatory power.	Percentage of Phenol.
1.	June 21, '95.	Light yellow.	From leaves only.	0.931 July 25.	0.931 at 24° C.	–3°16½′ in 220 mm. tube.	65.2 p.c.
2.	June 26, '95.	Light yellow.	From leaves only.	0.931 July 25.	0.931 at 25.5° C.	–1°19′ in 100 mm. tube.	67.6 p.c.
3.	July 2, '95.	Yellow (turbid).	Leaves and stems.	0.932 July 25.	0.939 at 20° C.	–2°45′ in 220 mm. tube.	72.0 p.c.
4.	July 9, '95.	Light yellow.	Leaves, stems and buds.	0.936 July 25.	0.939 at 23° C.	–2°12.7′ in 220 mm. tube.	69.6 p.c.
5.	July 16, '95.	Light yellow.	Leaves, stems, and some flowers.	0.932 July 25.	0.937 at 21° C.	–1°44¼′ in 220 mm. tube.	66.8 p.c.
6.	July 23, '95.	Light yellow.	Leaves, stems, flowers and buds.	0.932 July 26.	0.935 at 20° C.	–0°46′ in 100 mm. tube.	67.5 p.c.
7.	July 30, '95.	Greenish-yellow.	Leaves, stems and flowers.	0.935 Aug. 2.	0.941 at 15° C.	–1°45′ in 220 mm. tube.	72.0 p.c.
8.	Aug. 6, '95.	Light yellow.	Stems, leaves, flowers and seed.	0.923 Aug. 8.	0.9261 at 20° C.	–1°1.7′ in 100 mm. tube.	65.5 p.c.
9.	Aug. 13, '95.	Light amber.	Stems, leaves flowers and seed.	0.921 Aug. 15.	0.930 at 20° C.	–2°8′ in 200 mm. tube.	70.0 p.c.
10.	Aug. 20, '95.	Greenish-yellow.	Stems, leaves and buds.	0.927 Aug. 22.	0.932 at 21° C.	–2°3′ in 220 mm. tube.	64.4 p.c.
11.	Sept. 3, '95.	Greenish-yellow.	Stems and leaves.	0.916 Sept. 5.	0.925 at 20.5° C.	–2°12½′ in 220 mm. tube.	58.0 p.c.
12.*	Aug. 9, '95.	Light amber.			0.9311 at 20° C.	–1°2.9′ in 100 mm. tube.	63.0 p.c.

Estimation of Carvacrol.

The results of the carvacrol determinations recorded in Table I. were obtained by shaking 25 cm. of the oil with 75 cm. of a 10 p. c. solution of sodium hydroxide. The amount of oil not dissolved by the soda solution was read off and the difference was calculated as carvacrol.

It is known, however, that strong solutions of caustic alkali particularly not only dissolve phenols but other substances: hydrocarbons, alcohols, etc., as well. Oil No. 9, which when shaken but once with a 10 p. c. soda solution, showed a percentage of 70 p. c. of carvacrol; when shaken four times with a 5 p. c. solution of soda solution showed a percentage of only 54.8 p. c. carvacrol. Duplicate tests were made. The following table indicates the results of the repeated action of the soda solution in the oil in duplicate tests.

	I.	II.
First Reading............	26%	30.8%
Second Reading..........	51.2%	52.4%
Third Reading............	54.4%	55.2%
Fourth Reading.........	54.4%	55.2%

It thus becomes apparent that the amounts in the first have only a relative value.

Phenol determinations of the dark oil obtained from plants collected at Picnic Point were also made. In one estimation the oil, however, was diluted with an equal volume of petroleum ether. With a 10 p. c. soda solution the undiluted oil showed 65.3 p. c. and 65.6 p. c. respectively. Diluted with petroleum ether the oil showed with 10 p. c. soda solution 60.4 p. c. and 60.8 p. c. respectively. 100 cm. of undiluted oil shaken first with 300 cm., then with 100 cm., and lastly with 50 cm. of 5 p. c. soda solution gave respectively in duplicate tests the following results:

	I.	II.
First Reading............	42%	42.5%
Second Reading..........	52.5%	53.5%
Third Reading............	56.5%	57.5%

Titrimetric Estimation of Carvacrol.

5 gm. of the oil, diluted with 10 cm. of petroleum ether, were repeatedly shaken with 5 p. c.

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* Collected near Lake Wingra.

sodium hydroxide solution, until no more of the oil was dissolved. The oil was then tested for carvacrol by Flückiger's reaction, which consists in heating a few drops with chloroform and a little solid sodium hydroxyde, when, if carvacrol is present, a wine red color will appear. The absence of color will show that all of the carvacrol has been removed by the soda solution. The alkaline solution of carvacrol was made up with the 5 p. c. soda solution to 100 cm. or 200 cm. as the case required. To 10 cm. of this solution a sufficient quantity of $\frac{N}{10}$ iodine volumetric solution was added to convert all of the carvacrol into carvacrol iodide. To effect this a slight excess of iodine was necessary. In order to know when a sufficient quantity of iodine had been added, a few drops were removed from time to time and added to some diluted hydrochloric acid. In this way, free iodine can be detected as soon as it is in excess.

The mixture was then made up to 500 cm. and filtered. The carvacrol iodide did not separate readily, but separation could be induced by agitation of the milky liquid. To 100 cm. of the filtrate diluted hydrochloric acid was added and the liberated iodine estimated with $\frac{N}{10}$ sodium thiosulphate volumetric solution. The quantity of $\frac{N}{10}$ sodium thiosulphate required, multiplied by 5, gives the quantity of $\frac{N}{10}$ iodine solution that had been added in excess. From this the amount of iodine required can be easily found.

Every molecule of carvacrol requires four atoms of iodine, therefore every cm. of $\frac{N}{10}$ iodine volumetric solution is equivalent to 0.0037415 cm. of carvacrol.

Only a few of the specimens of oil were tested according to this method.

No. of Oil.	By titration.	By volume.*	Percentage by volume in 100 cc. cylinder.†
1.	1st. 52.00 p.c. 2nd. 52.3 "	64%	65.2%
2.	1st. 54.7 p.c. 2nd. 54.00 "	66%	67.6%
7.	1st. 58.48 p.c. 2nd. 58.00 "	70%	72%
	1st. 58.20 p.c. 2nd. 58.40 "	71%	
10.	1st. 53.34 p.c. 2nd. 53.36 "	64.5%	64.4%
	1st. 54.46 p.c. 2nd. 54.26 "	65.5%	

Isolation of Carvacrol.

The aqueous alkaline solution containing the sodium carvacrolate was distilled with water vapor to remove any dissolved non-phenol portions of the oil. The solution was then acidulated with 50% sulphuric acid and again distilled and identified as carvacrol iodide into which all of it was converted. In the flask there remained a dark-brown tarry residue. An attempt to sublime this between watch-glasses proved a failure.

Non-Phenols.

The combined portions of non-phenols from the various oils were distilled with water vapor. The first portion came over very clear, and then a much darker portion. These were kept separate. The light portion had a specific gravity of 0.847 at 21° C. and rotatory power of 24′ in 220 mm. tube. The dark portion had a specific gravity of 0.874 at 21° C. and rotatory power of —7° 50′ in 220 mm. tube.

In order to ascertain the presence or absence of esters in this portion of the oil, the following ester determinations were made. 10 cm. of the light portion were boiled for one hour with 50 cm. of a 50% alcoholic potassium hydroxide solution. Upon titration of the alkali it was found that no saponification had taken place. The same experiment was tried with the dark portion with like results.

The light and heavier oils were then fractionated separately, the results of the fractionations being recorded in the following table:

Fraction.	Light Oil.	Heavy Oil.	Total.
—170°	75.0 cm³.	18.0 cm.	93.0 cm.
170°—180°	55.5 cm³.	47.0 cm.	102.5 cm.
180°—190°	5.5 cm³.	10.0 cm.	15.5 cm.
190°—200°	2.0 cm³.	11.5 cm.	13.5 cm.
200°—220°		11.0 cm.	11.0 cm.

The corresponding fractions were then mixed and refractionated. The results of the second fractionation, together with quantity, specific gravity, and rotatory power of the fractions are recorded in the last table.

Table II.

Fraction.	Quantity.	Sp. gr. @ 20° C.	a *	$[a]_D$
160°—165°	6.0 ccm.	0.8474		
165°—169°	8.8 ccm.	0.8438	—2°—1′	—2.37
169°—170°	8.5 ccm.	0.8460	—1°—30′	—1.77
170°—171°	11.0 ccm.	0.8427	—1°—2′	—1.22
171°—172°	9.0 ccm.	0.8628	—1°—0′	—1.15
172°—173°	16.0 ccm.	0.8488	—0°—10′	—0.19
173°—174°	20.0 ccm.	0.8682	—0°—8′	—0.15
174°—175°	25.5 ccm.	0.8440† 0.8652 at 4°	+0°—36′†	+0.71
175°—176°	18.5 ccm.	0.8480† 0.8663 at 4°	+1°—2′†	+1.22
176°—177°	14.5 ccm.	0.8502	+1°—34′	+1.84
177°—178°	11.0 ccm.	0.8547	+1°—25′	+1.67
178°—179°	10.5 ccm.	0.8528	+1°—35′	+1.88
179°—180°	9.0 ccm.	0.8573	+1°—44′	+2.02
180°—182°	8.0 ccm.	0.8649	+1°—35′	+1.83
182°—184°	9.0 ccm.	0.8650	+1°—58′	+2.23
184°—188°	7.8 ccm.	0.8686	+1°—45′	+2.01
188°—193°	.5 ccm.			
193°—198°	.5 ccm.			
198°—200°	2.5 ccm.			
200°—210°	3.5 ccm.			
210°—220°	3.0 ccm.			
220°—230°	1.0 ccm.			
230°—235°	2.0 ccm.			
235°—240°	11.5 ccm.	0.9430		
Residue	3.0 ccm.			

This table emphasizes what was demonstrated a year ago. More oil is being distilled this year, so that larger fractions of the non-phenol constituents may be obtained for a more detailed chemical examination.

Pharm. Chem. Laboratory,
University of Wisconsin.

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* Burette reading. For further details see: The volumetric estimations of phenols by Edward Kremers and O. Schreiner, results soon to be published.

† Taken for comparison from the first table.

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* In a 100 mm. tube at 20° C.

† At 24° C.

Salol in Salicylic Acid.*

By Dr. *Fred. Hoffmann.*

Among the queries proposed by the Committee on Scientific Papers for the present annual meeting of the American Pharmaceutical Association is one in regard to the occasional presence of salol in commercial synthetic salicylic acid. In order to account for this fact it is not necessary to enter upon any consideration of the various methods of the preparation or the properties and reactions of salicylic acid, but simply to call to mind the fact that this acid when exposed to heat suffers at about 160 to 240° C., a decomposition, partly into phenol and carbonic acid, and partly into anhydrides which by a partial re-combination with the phenol form salol. One of the various patented methods of the manufacture of salol is based upon this process.

The direct transformation of salicylic acid into salol by heat may be indicated by the following equation:

$$\underbrace{2C_6H_4\left\{\begin{matrix}COOH\\OH\end{matrix}\right.}_{\text{Salicylic acid.}} = \underbrace{C_6H_4\left\{\begin{matrix}COOC_6N_5\\OH\end{matrix}\right.}_{\text{Salol.}} + \underbrace{H_2O}_{\text{Water.}} + \underbrace{CO_2}_{\text{Carbonic acid.}}$$

As is well known, or may readily be ascertained from any work on pharmaceutical chemistry, the various older methods of manufacture of synthetic salicylic acid involve for the final isolation and purification of the acid processes of precipitation and subsequent re-crystallization from solutions of the acid whereby impurities and by-products, including traces of phenol and salol, are entirely removed. While the original patentees and manufacturers of synthetic salicylic acid continue in their approved methods of purification, some other manufacturers more recently seem to employ processes of distillation or of sublimation for the purification of their product. In this case the above equation accounts for the fact that such brands of salicylic acid may contain traces of salol. But as salol has a slight but distinct aromatic odor while pure salicylic acid is entirely odorless, no manufacturer will bring a product into the drug-market which contains so much salol as to *prima facie* indicate such contamination by the odor of salol. If such occasionally is met with in salicylic acid it can only be due to insignificant traces, which from a therapeutic point of view are of no consequence since both substances have a similar action and use.

In order to ascertain the presence of salol in salicylic acid a sample is dissolved in a dilute aqueous solution of sodium or ammonium carbonate without applying heat. Pure salicylic acid renders a clear solution while salol, being insoluble, gives a turbid one. Being readily soluble in ether, the salol is extracted from the turbid salicylic acid solution by shaking with a little ether. The ethereal solution is then separated and shaken with about half its volume of distilled water in order to remove traces of salicylic acid. The ethereal solution is separated and evaporated on a watch-glass at a gentle heat. The residue is dissolved in a few drops of alcohol and left standing for crystallization. The dry residue or the crystals of salol are identified by its characteristic low melting point at 42 to 43° C., while salicylic acid melts at about 157° C.

In view of the absurd statements occasionally met with in American trade-papers, that "salicylic acid made from phenol, unless carefully purified, contains highly toxic by-products, while that made from oil of wintergreen is pure" and similar ones, well-informed practitioners of medicine and pharmacy need not be reminded of the fact that any objectionably impure salicylic acid, unless artfully adulterated, is excluded from the drug-market not only by the pharmacopœial requirements, but as far as a contamination with salol is concerned, by the very nature and characteristic odor of this phenyl salicylate. Moreover, as stated before, the presence of salol can only amount to traces insignificant in the medicinal, industrial and household application of salicylic acid.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Bohlig's reagent for ammonia. I. A solution of 1 p. mercuric chloride in 30 p. water. II. A solution of 1 p. potassium carbonate in 50 p. water. Free ammonia and that combined with carbonic acid produce a white turbidity with solution I. If this reaction is first brought about upon the addition of solution II, the ammonia is combined with other acids.

Bonastre's reaction for myrrh. Strips of filter-paper are saturated with tincture of myrrh and after drying moistened with a drop of nitric acid. In the case of genuine myrrh a violet color is produced.

Borntraeger's aloe reaction. An alcoholic extract of aloes is shaken with benzin. The benzin solution after separation from the alcoholic layer and upon the addition of a trace of strong ammonia water is slightly heated while shaken. Aloes (also other substances, such as rhubarb, curcuma, galls, catechu) effect a violet coloration of the ammoniacal solution.

Bouchardat's reagent for alkaloids. (Iodine in potassium iodide.) 10 g. of iodine and 20 g. of potassium iodide are dissolved in 500 g. water. With the aqueous solution of most alkaloids this reagent produces reddish-brown precipitates.

Boudart's test for the distinction between fatty oils. The oils are mixed with nitric acid, sp. gr. 1.45 to 1.50. In the case of genuine cod liver oil carmine-red coloration is gradually produced.

Boudet's reagent for fatty oils is fuming nitric acid. Upon the addition of 5 p. c. of this acid olive oil becomes solidified. See *Barbot.*

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* Read at the Montreal meeting of the American Pharmaceutical Association, August, 1896.

* Continued from p. 183.

Brand's reaction for quinine and quinidine. The salts of both alkaloids, triturated with a little chlorine water, are colored green upon the addition of ammonia. (Thalleiochin reaction.) If to the solution of the alkaloids, after the addition of a slight excess of chlorine water, ammonia water is added drop by drop, a green flocculent precipitate is first produced which dissolves with a green color in an excess of the ammonia water.

Brand's reaction for fluorine in beer. This is a modification of *Nivièr's* test (q. v.) The fluorine in the precipitate is converted into hydrogen fluoride by means of sulphuric acid, and the former acid identified by means of its etching properties. For details see Zeitschr. f. d. ges. Brauwesen, 1895, p. 317.

Braeutigam-Edelmann's test for horse meat. 50 g. of the meat to be tested are boiled with 200 g. of water for one hour. The filtered extract is evaporated to one-half its volume. After the albumen has been removed by means of dilute nitric acid, iodine water is added so as to form a layer. Horse meat, on account of its large percentage of glycogen, produces a burgundy-red zone. Starch and dextrin interfere with the reaction: the former producing a blue, the latter a red color.

Braun's test for glucose. A solution of glucose heated with a few drops of a solution of picric acid (1:20) produces a deep red coloration.

Braun's nitric acid reaction. Upon the addition of a small quantity of aniline sulphate and subsequently of concentrated sulphuric acid to a solution of a nitrate (or of free nitric acid) a violet-blue coloration results.

Bronardel and **Boutney's** reaction for the distinction between ptomaïnes and plant alkaloids. I. With potassium ferricyanide and ferric chloride ptomaïnes produce a blue color. II. With the aid of a quill and the solution of the alkaloid or ptomaïne some words are written on silver bromide paper. After the paper has been laid aside for ½ hour, protected against the light, it is developed with hyposulphite. In case of ptomaïnes the script appears black, but not in case of plant alkaloids. (Morphine also yields reaction I. [comp. *Kieffer's* reaction]; in fact none of the reactions based on the reducing properties can be considered characteristic.)

Bruecke's reaction for the coloring matter from bile. See *Gmelin's* reaction.

Bruecke's biuretreaction for albumenous substances. Coagulated albumen assumes a handsome violet color when treated first with dilute copper-sulphate solution, and, after removal of the excess of this reagent, with dilute soda solution. Comp. *Rose's* biuretreaction.

Bruecke's reagent for glucose. 5.5 g. freshly precipitated, moist bismuth subnitrate are boiled for 10 minutes with a solution of 30 g. potassium iodide in 100 g. water. Then 5 g. of 25 p. c. hydrochloric acid are added. Glucose (diabetic urine) effects reduction with formation of a brown or black coloration.

Brullé's test for foreign oils (cotton seed oil) in olive oil. 10 ccm. oil are boiled with 0.1 g. of pulverized albumen and 20 ccm. nitric acid. As soon as all of the albumen is dissolved, the genuine oil is almost colorless; upon cooling, turbid and straw-yellow. The color remains the same after standing 24 hours and the liquid solidifies. In the presence of cotton seed oil the liquid becomes orange to brownish-red upon solution of the albumen. As a rule no solidification takes place.

Brunner's reaction for glucosides. Upon heating with bile and sulphuric acid a red color is produced (reversed *Pettenkofer's* reaction).

Buckingham's reagent for alkaloids is a freshly prepared solution of 1 g. ammonium molybdate in 16 g. of concentrated pure sulphuric acid. Heat is applied until the solution is clear. The reagent yields precipitates of different color with various alkaloids. Comp. *Hager*, Pharm. Praxis, I, 209.

Cailletet's reagent for fatty oils is a mixture of 12 parts phosphoric acid, sp. gr. 1.44, 7 parts sulphuric acid, sp. gr. 1.84, and 10 parts nitric acid, sp. gr. 1.37. According to other authorities it is nitric acid saturated with nitrous acid.

Cailletet's test for copper in oils. 10 ccm. oil are shaken with a solution of 0.1 g. pyrogallic acid in 5 ccm. ether. If copper is present a brown coloration and turbidity results.

Campani's reagent for glucose is a mixture of concentrated lead acetate solution with dilute copper acetate solution. Cane-sugar does not change the solution, glucose reduces the copper salt.

Capezznoli's reagent for sugar consists in the precipitation of ferric hydroxide with an excess of potassa solution. If sugar is present a dark orange-yellow ring is produced near the upper zone of the precipitate.

Caprauika's reaction for the coloring matter from bile. A solution of bromine in chloroform is added to the urine in question. In the presence of coloring matter from bile a greenish coloration is produced, which upon the addition and shaking with hydrochloric acid is conveyed to the acid.

Carlinfanti's modification of *Baudouin's* test (q. v.). After shaking the oil with the hydrochloric acid containing sugar the mixture is allowed to clarify. If sesame oil is present the hydrochloric acid appears purplish red. This color is permanent after the addition of three parts of water, whereas similar coloration, due to the presence of pure olive oil, disappears upon subsequent dilution.

Carpené's reagent for tannin (in wine) is a cold saturated solution of zinc acetate in 5 p. c. ammonia. Tannin causes a precipitation of this reagent.

Castle's reagent for bromine and iodine is dichlorbenzene sulphamide. The solid reagent or its solution in chloroform is added to the solution of the halide. From iodides and bromides the haloides are liberated as with free chlorine and can be recognized by the color they impart to carbon disulphide or chloroform.

Cazeneuve's test for coal tar dyestuffs in wines. The wine is shaken with yellow mercuric oxide. The filtrate from natural wines is colorless. If aniline dyes are present it is distinctly colored.

Christen's reaction for albumen. Tannin produces a turbidity, respectively a precipitate with a solution of albumen.

Clarus' reagent for solanine is chromic acid solution, with which the alkaloid produces a sky-blue color.

Conrady's test for cane sugar (in milk sugar). 1 g. milk sugar is dissolved in 10 ccm. water; 0.1 g. resorcin and 1 ccm. hydrochloric acid are added and the mixture boiled for five minutes. In the presence of cane sugar a reddish coloration is produced.

Contejean's test for free hydrochloric acid in the stomach juice. A drop of the stomach juice is heated with cobaltic hydroxy-carbonate in a watchglass. If hydrochloric acid is present, cobaltic chloride is found, which colors the solution blue upon evaporation.

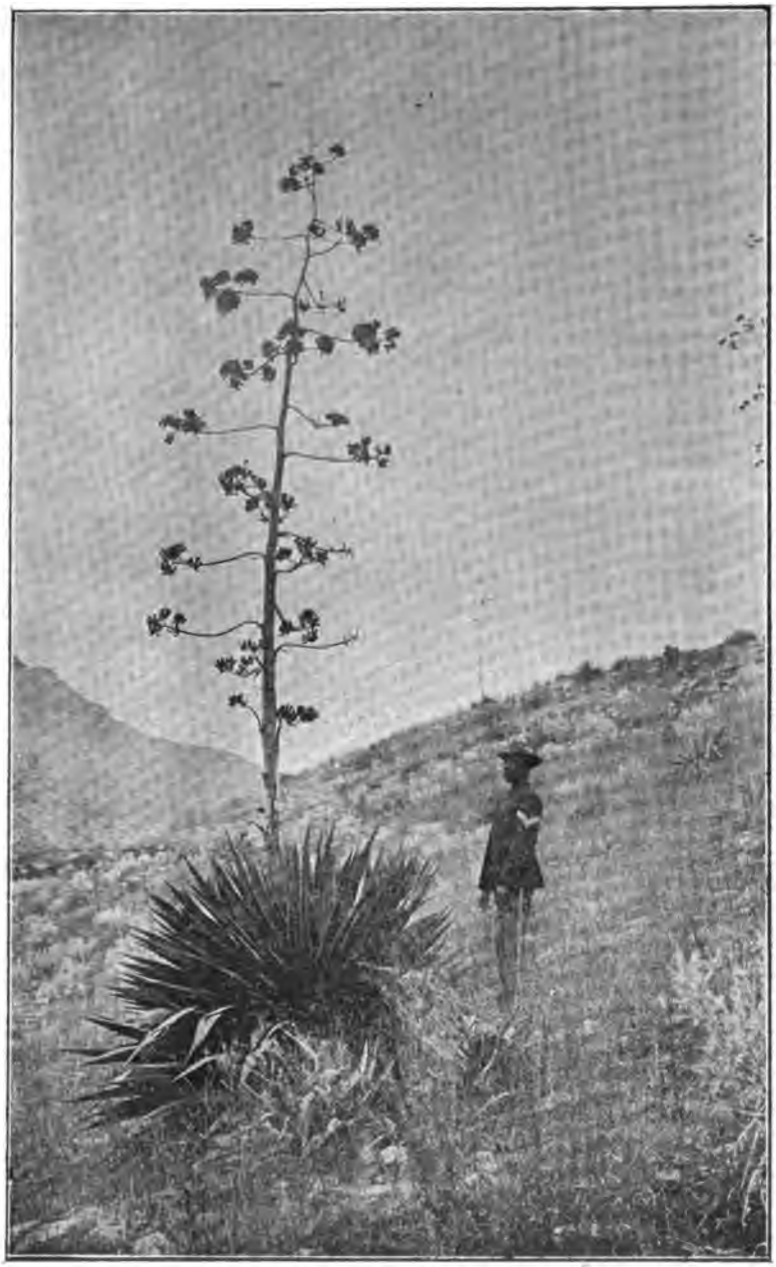

Plate 1. **Agave Palmeri.**

[From Seventh Report of Missouri Botanical Garden by permission of the Director.]

Cotton's phenol reaction. See *Lex's* reaction.

Crace-Calvert's reaction for fatty oils. The oils are treated with sulphuric acid and nitric acid of given concentration, or with phosphoric acid and nitro-hydrochloric acid and the color reactions are observed. Or the oils are treated with soda lye, either directly or after the addition of hydrochloric acid and changes in color and consistency observed. For detailed information see *Benedikt*, Analyse der Fette, II. Aufl., 307.

Creuse's test for salicin in quinine. Potassium bichromate and dilute sulphuric acid produce no change with quinine. If salicin is present the odor of salicylic aldehyde is produced.

Cronzel's test for vegetable and animal fats in vaselin. Upon trituration with permanganate solution the presence of such fats produces a brown coloration.

Cripp's and **Dymond's** test for aloes. 0.05 g. aloes or the corresponding residue left upon evaporation are triturated with 16 drops of concentrated sulphuric acid. Then 4 drops of nitric acid, sp. gr. 1.4, and 30 g. water are added. A coloration varying from orange to carmine is produced, which is darkened to a deep wine-red upon the addition of ammonia. (Rhubarb, senna, frangula interfere with the reaction.)

All aloines are precipitated by ferric chloride or lead acetate. Barbaloine and Nataloine are colored carmine-red by cold nitric acid, Soc aloin and Curaç aloin are colored red by fuming nitric acid.

Barbaloin, dissolved in a drop of concentrated sulphuric acid, is colored red upon the addition of nitric acid, Nataloin blue.

Dahlmann's reagent or testing paper is a very dilute solution of gold and sodium chloride. Bleached and unbleached sulphite cellulose, sulphate cellulose and soda cellulose produce a reddish-brown color, wood-fibre a yellow color, and bleached straw paper no color.

Danielewsky's test for aromatic substances in blood etc. An azo-reagent (diazo sulphanilic acid ?) is added, the solution slightly acidified with hydrochloric acid and then made alkaline. The presence of aromatic compounds is indicated by the formation of an orange-red color.

David's alcoholic acetic acid for the examination of fatty acids consists of 300 ccm. of 95 p. c. alcohol and 220 ccm. of a mixture of equal volumes of glacial acetic acid and water. This reagent dissolves only the liquid olefinic acids from a mixture of fat acids, whereas the solid fatty acids remain undissolved.

Davy's test for arsenic. See *Marsh's* test.

Davy's test for phenol. Molybdic acid dissolved in concentrated sulphuric acid produces a violet coloration with phenol.

Day's test for mucus. The formation of a blue color upon the addition of 1 to 2 drops of oxidized tincture of guaiac (old, or shaken with air) to urine indicates the presence of mucus.

Deiss' modification of *Labiche's* test for cottonseed oil. See *Labiche*.

Delf's reagent for alkaloids. See *Mayer's* reagent.

Denigés' reagent for the detection of nitrous acid.

1.) a) A solution of phenol 1 g. and 4 ccm. sulphuric acid in 100 ccm. water;
    b) A solution of mercuric oxide 3.5 g. in 20 ccm. glacial acetic acid, and 100 ccm. water; ½ ccm. of sulphuric acid is added and filtered.

Equal volumes of a) and b) are mixed, heated to the boiling point and 1 to 2 drops of the solution to be tested are added. The presence of nitrite causes a red coloration. This reagent is the reverse of *Plugge's* phenol reaction and was first mentioned by this author.

2.) Two ccm. aniline are dissolved in 40 ccm. glacial acetic acid and the solution diluted with water to 100 ccm.

5 ccm. of this solution and a requisite amount of the solution to be tested (1 drop to 10 ccm. according to concentration) are boiled. The presence of a nitrite is indicated by the formation of a straw-yellow to orange color, which becomes red upon the addition of an acid.

3.) A solution of 1 g. resorcin in 100 ccm. water and 10 drops sulphuric acid. Four drops of the solution to be tested, 2 ccm. of pure sulphuric acid and 5 drops of the resorcin are shaken. Nitrous acid produces a carmine or violet coloration.

Denigés' reagent for hydrogen peroxide is a mixture of 1 ccm. of a 10 p. c. aqueous ammonium molybdate solution and 1 ccm. concentrated sulphuric acid. Hydrogen peroxide produces an intensely yellow color with this reagent.

Derbassin's test for nitric acid. See *Roehmont's* test.

Deubner's test for coloring-matter from bile. See *Gmelin's* reaction.

De Vry's herapathite reaction for quinine. To 8 parts of quinoidine sulphate dissolved in 8 parts of 5 p. c. aqueous sulphuric acid an iodine solution (1 p. iodine, 2 p. potassium iodide and 100 p. water) is gradually added. The resinous precipitate, after washing and drying, is dissolved in six times its weight of 92 to 94 p. c. alcohol, the solution filtered and evaporated. The residue is dissolved in five times its weight of alcohol. This solution produces with solution of quinine sulphate a precipitate of iodosulphate of quinine.

De Vry's quinine test (chromate test). To a solution of 1 g. quinine, dissolved in 45 ccm. boiling water, 2.5 g. of neutral potassium chromate are added; the solution is cooled to a temperature of 15°; and after an hour the crystallized quinine chromate is filtered off. To 10 ccm. of the filtrate one drop of soda solution is added or sufficient to effect a reddening of phenolphthaleïn paper. If the quinine was free from other cinchona alkaloids, the solution remains clear, also upon heating; if other alkaloids were present a turbidity is produced.

Dietrich's reaction for uric acid. Upon the addition of sodium hypochlorite solution containing bromine to a solution of uric acid an unstable rose-red color is produced.

Di Vetere's test for castor oil in olive oil. Upon shaking a sample of the oil with concentrated hydrochloric acid three layers are formed if castor oil is present.

Dobbin's reagent for caustic alkali is a solution of mercuric iodide, potassium iodide and ammonium chloride. Caustic alkalies, including ammonia, produce a yellowish to reddish-brown color or precipitate. The reagent is prepared by adding a solution of mercuric chloride to a solution of 5 g. potassium iodide until a permanent precipitate is produced. This is removed by filtration. Then 1 g. ammonium chloride is added and sufficient dilute caustic soda solution until again a permanent precipitate is produced. The filtrate is diluted to 1 liter.

This reagent is serviceable for the detection of traces of alkali in potassium and sodium carbonate.

Donath's test for nitrogen. 0.05 g. substance are heated with 1 g. potassium permanganate and 20 ccm. pure, saturated potassa solution to boiling. If necessary more permanganate is added to effect permanent coloration. Upon cooling the mixture is diluted with water, the excess of permanganate destroyed by the addition of alcohol, the precipitate removed by filtration and the filtrate tested for nitric acid according to known methods.

Donné's test for mucus (in urine). To the sediment, obtained by removing the supernatent liquid, a fragment of caustic potassa is added and the mixture is stirred. Mucus is colored greenish and gelatinizes to a lumpy mass; a gelatinous sediment is partly dissolved, partly converted into a flocculent precipitate.

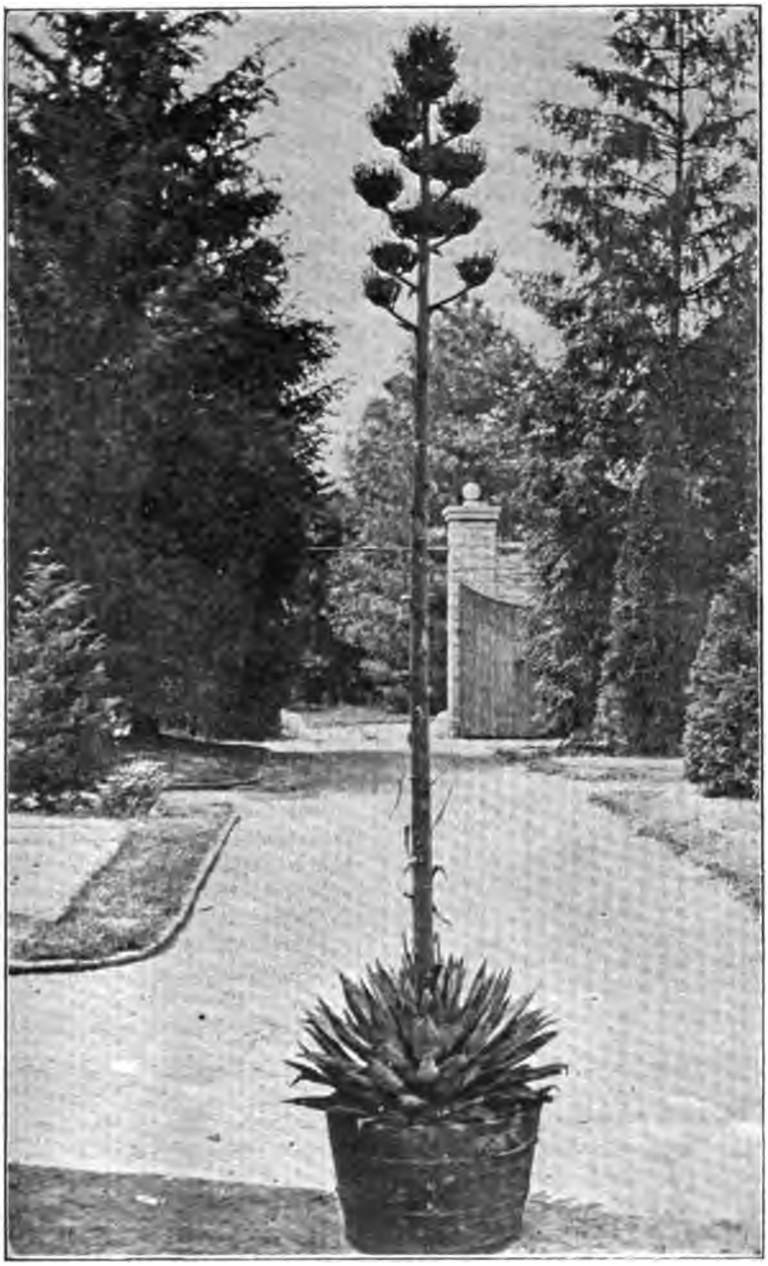

Plate 2. **Agave applanata.**

[From Seventh Report of Missouri Botanical Garden by permission of the Director.]

Dragendorff's reagent for alkaloids. (Potassium-bismuth iodide). Bismuth iodide is heated with a solution of potassium iodide, the mixture filtered while hot, and to the hot filtrate an equal volume of cold concentrated solution of potassium iodide is added. The concentrated solution is permanent, the dilute solution not. According to *Frohn* the reagent is prepared by suspending 1.5 g. of freshly precipitated bismuth subnitrate in 20 g. water, heating the mixture to the boiling point and adding 7 g. potassium iodide and 20 drops of hydrochloric acid. The reagent produces a reddish-brown precipitate with alkaloids, but also with albuminous substances.

Comp. *Mangini's* and *Thresh's* reagent.

Dragendorff's test for alcohol in volatile oils. Metallic sodium is added to the oil in question. If alcohol is present hydrogen is generated and a brownish color is produced.

Dragendorff's test for coloring-matter from bile. See *Gmelin's* test.

Drechsel's test for "Gallensäuren." See *Pettenkofer's* reaction.

(To be continued.)

MONTHLY REVIEW.

Chemistry.

Chemistry of Human Milk.

The analysis of Fr. Soeldner and Wm. Camerer shows that human milk contains less proteïd matter than was previously supposed. 100 grams of milk collected, on the average, in the second week after parturition, contain 1.52 proteïd, 3.28 fat, 6.5 sugar, 0.27 ash, 0.05 nitric acid, 0.78 unknown extractives, 12.4 total dry residue. The unknown extractives, which are almost absent in cow's milk, are increased in the colostrum.

[J. C. S., 70^{II}, p. 378; from Zeit. Biol., 33, p. 43.]

Mercury Silico-fluoride as Antiseptic.

The experiments of Hallion, Lefranc and Ponpinel have shown the silico-fluoride of mercury to be a valuable antiseptic. On *Bacillus pyocyaneus*, *Bacillus diphteriticus* and *Bacillus anthracis* it acts twice as powerfully as sublimate. Inasmuch as experiments on animals have shown it to be a much weaker poison on the animal organism, the authors recommend it highly as antiseptic. It can be used in aqeous solution 1:1000 or as vaselin ointment 1:2000.

[Apt. Ztg. 11, p. 516; from Rep. de Pharm. [3], 7, p. 124.]

Detection of Nitrites.

P. Sabatier reports on a reaction of cuprous compounds, which can be used for the identification of nitrites. If to a solution of a small quantity of sodium nitrite in concentrated sulphuric acid a few fragments of cuprous oxide are added, these are dissolved with the formation of an intensely violet to purplish color. All cuprous compounds as well as the cuprous-cupric derivatives yield the same reaction. Metallic copper, obtained by the reduction of CuO by means of hydrogen, reacts with a stronger evolution of NO.

Cupric compounds do not react. Neither is any color produced by mercurous or mercuric derivatives, or by salts of lead, silver, tin, manganese, cobalt and nickel.

[Apoth. Ztg. 11, p. 575; from Chem. Ztg. 20, p. 521.]

A New Diastatic Ferment.

MM. Bertrand and Malèvre, who have been working upon pectase, a new diastatic enzyme, find that it is very widely distributed among plants; so widely that they feel justified in saying that it may be regarded as universally diffused in green plants.

It is especially abundant in leaves and probably spreads to the other organs. It may be prepared from alfalfa or clover by braying in an iron mortar full grown plants, whose juices are then expressed. This fluid is saturated with chloroform to prevent alteration by micro-organisms and set aside from 12 to 24 hours in an open flask protected from light. It then undergoes a special coagulation which renders it easy to filter. To the clear liquid twice its volume of 90 percent alcohol is added, which throws down a white precipitate which is collected and dissolved in a little water. After twelve hours it is filtered and the almost colorless liquid which runs through is received in four to five volumes of alcohol. The pectase separates anew and is collected and dried in a vacuum. In this way a liter of juice yields 5—8 g. of a white, non-hygroscopic substance, very soluble in water, which produces a vigorous pectic fermentation. A 1 percent solution of pectin will be coagulated in forty-eight hours by the addition of $\frac{1}{1000}$ of its weight of the pectase from alfalfa, or $\frac{1}{1000}$ of the pectase from clover. [Bot. Gaz. 22, p. 65; from Jour. de Bot. (1896).]

Potato Poisoning.

A number of soldiers in the garrisons in Alsace and in Lyons, at different times, were seized with symptoms indicating poisoning after eating potatoes of doubtful quality. Those used in Alsace were chiefly new and unripe; those consumed by the Lyons garrison were old, having already sprouted.

These occurrences led to a chemical examination with especial reference to the solanine present under various circumstances and gave very interesting results.

Fresh potatoes, not sprouted, from November to February contain from 0.04 to 0.046 percent of solanine; when peeled from 0.02 to 0.25 percent. Old potatoes that have sprouted in the period from March to July may contain from 0.08 to 0.116 percent. When made to sprout artificially and the sprouts were about one tenth of an inch long, 0.212 percent was found. It was especially abundant in the sprouts themselves; in samples one third of an inch long 5.0 percent of solanine was found. With the growth of the sprout it diminishes; in specimens about three inches long only about 2.7 percent of the alkaloid being found.

Soft withered potatoes contained 0.144 percent, a black moulded piece a year old contained 1.34 percent.

The dwarf potatoes produced by sprouting in the cellar were particularly rich in solanine containing as much as 0.52 percent. The conclusion is that potatoes to be poisonous must contain an exceptional proportion of solanine and be old, withered or sprouting.

[New York Medical Journal, 64, p. 127; from Centralblatt f. d. gesammte Therapie, July (1896).]

Products of the Destructive Distillation of Linseed Oil.

In an interesting paper read at the Montreal meeting of the Am. Pharm. Ass'n., Prof. F. P. Sadtler demonstrated that practically the same products are obtained when linseed oil is distilled under pressure as when codliver oil is subjected to the same treatment. Prof. Engler of Karlsruhe at the World's Fair Congress of Chemists exhibited specimens of petroleum obtained by him from fish oil. Later he also isolated solid paraffin. The same products were obtained by Prof. Sadtler from linseed oil and exhibited at Montreal. He also expects to obtain similar results from the destructive distillation of other vegetable fats.

These observations are of theoretical interest because they assist in exploding one sided views with regard to the formation of natural petroleum.

They are, however, also of great practical importance. If instead of allowing the hydrocarbons to escape which are formed when linseed oil is heated, they are compelled to flow back, the yield of boiled oil is considerably increased. In one experiment as much as 50 p. c. of distillate was obtained. The boiled product which results if the oil is heated in an autoclave instead in an open vessel or a still therefore will contain products identical with ordinary petroleum. This is suggestive of some delicate problems for the forensic chemist and lawyer.

Copper in Foods and Drinks.

Dr. B. H. **Paul** and A. J. **Cownley** criticize methods for determining the copper content of organic substances used by Vedrödi and by Lehmann and propose the following as ready and accurate.

One hundred grams of the material are carbonized in platinum, the ash extracted with strong hydrochloric acid, filtered through an acid-washed filter, the filter washed with hot water—all into a porcelain dish. The residue which is insoluble in hydrochloric acid is treated with a few drops of strong nitric acid, then aired and ignited. The ignited mass is treated with strong hydrochloric acid and the filtered solution is added to the first portion. The hydrochloric acid solution after concentration to about 30—40 cc. is placed in a weighed platinum dish and the copper precipitated by pure zinc. If the deposited copper after weighing is not of a pure copper color, it is dissolved in a little nitric acid made up to a known quantity and the copper determined colorimetrically in an ammoniacal solution.

By this method the following results, giving the amount of copper found in various alimentary substances, were obtained. The copper content is indicated in number of parts per 10,000 parts of the substance investigated.

Oysters	1.81—3.03
Cocoa	0.29—0.58
Brandy	0.01—0.05
Whisky	0.04
Preserved Peas	0.54—1.44

For comparison with these results, the following by Vedrödi are added.

Winter wheat	2.5—8.6
Summer wheat	2.5—3.0
Barley	0.1—0.9
Linseed	1.4—1.9
Peas	0.9—1.5
Mustard Seed	0.9—1.0

[Pharm. Journ., 1896, p. 442.]

A New Apiol.

G. **Ciamician** and P. **Silber** have examined the higher fraction of dill oil, which constituted about 30 p. c. of an oil distilled by Schimmel & Co. from East Indian seed. The product was subjected to fractional distillation. About two-thirds consists of the new apiol, $C_{12}H_{14}O_4$, which distills at 162° under 11 mm. pressure, and at about 285° under ordinary pressure with slight decomposition.

The new apiol, like that obtained from parsley, contains two methoxy groups, viz. $C_{10}H_8O_2\ (OCH_3)_2$.

In distinction from the apiol from parsley, the apiol from dill oil is an oily, almost odorless liquid, which does not congeal when exposed to a low temperature. It is insoluble in water, but soluble in the ordinary solvents, and is not affected by aqueous alkali. Like the known apiol it is converted into an isomer, isapiol, when boiled with alcoholic potash or with sodium ethylate. The isapiol forms colorless prisms melting at 44°.

Apparently the two apiols contain the same nucleus, viz. tetraoxybenzene, and differ from each other in the relative position of the methylene group to the two oxymethyl groups.

[Pharm. Ztg. 41, p. 521; from Ber. 1896, No. 11.]

Titrimetric Determination of Copper.

M. **Rupean** uses a solution of picric acid of known strength and precipitates with it the copper from ammoniacal solution. The copper solution is titrated until it is green; then the copper picrate is allowed to precipitate and the titration is continued until the solution is yellow without a greenish tint.

Of a solution of 7.2 g. picric acid in ammonia diluted to one liter each ccm. precipitates 1 mg. copper from its ammoniacal solution. The copper solution is diluted so as to contain 1 gram copper in a liter. If the solution contains silver and zinc besides copper no modification is necessary since the picrates of these metals are soluble in ammonia. If lead is present tartaric acid is added, because in the presence of the ammonium tartrate formed the lead salt also remains in solution. Iron is first converted into the ferric salt and then precipitated with ammonia, when the lead can be estimated as usual.

[Apt. Ztg. 11, p. 576.]

Botany and Pharmacognosy.

Acid Root Secretions.

Dr. **Friedrich Czapek** denies that the acid secretion from root tips is hydrochloric acid or any of the organic acids suspected by various investigators at various times. The only free acid found is carbonic acid exhaled as a result of the respiration of the living root. The acid reaction seen when roots are grown above blue litmus paper is due in most cases to primary potassic phosphate or more rarely to primary potassic oxalate.

[Ber. d. deutsch. bot. Gesellsch., 14, p. 29.]

An Old Locust Tree.

At Britz, a suburb of Berlin, stands a locust tree, *Robinia pseudacacia*, that was sent in 1720 from America in a flower pot to the then owner of the place and planted in its present location. As a result of the good care bestowed upon it, the plant flourished and was a pleasure to many interested in it, among them King Frederick William IV. Fifty years ago it was barely able to support its wide-spreading branches and iron supports were made use of. Since then, however, it has suffered greatly from storms. Not far from it is a shoot from the parent tree which has a diameter of more than a meter.

[Die Natur, 45 (1896), p. 302; from Gartenflora (1896), Heft 10.]

A New African Caoutchouc Tree.

In the colonies Goldcoast and Lagos it has recently been ascertained that the tree known as Ire, Ireh or

Ereh, *Kickxia Africana*, furnishes valuable caoutchouc. The caoutchouc export from these places has been by this means extraordinarily increased. The *Kickxia* reaches a height of 18—21 m. Each tree furnishes during the rainy season 10—15 pounds of caoutchouc. The seeds of the *Kickxia* are often deceptively mixed with those of the *Stropanthus*. To obtain the sap an incision of from 2—3 cm. breadth is made which reaches the inner bark and extends the whole length of the trunk. Incisions leading obliquely to the main tap are made on both sides in order to conduct all the sap into the basin at the foot of the tree.

The sap is prepared for caoutchouc in two ways. It is either filtered or allowed to evaporate for 14 days in a trough and then pressed. This caoutchouc brings 9 d. to 1 s. per pound. The tree seems to adapt itself easily to cultivation, a characteristic not found in the case of the Landolphias.

[Gaea 32, p. 506; from Deutsches Kolonialblatt.]

Genuine and Poisonous Star Anise.

Dr. Walter Laurén, as the result of a thorough study of the fruits of the true star anise (*Illicium verum* Hook., F.,) and the poisonous article (*I. religiosum* Lieb.) that sometimes becomes confused with it, finds that both anatomical and chemical differences exist. The columnar cells of the endocarp of *I. religiosum* are smaller than those of the genuine drug because shorter. The transition of the schrenchyma cells on the surface of deshiscence into the palissade cells in *I. religiosum* is very sharp; in the true star anise very gradual. The walls of the schrenchyma cells become gradually thinner and thinner and the cells finally pass over into the palissade form. In *I. verum* the palissade cells have an average length of 500 μ; in *I. religiosum* 375 μ.

If developed seeds occur, which is rarely the case in the false anise, the form and size of the alemone grains furnish a basis for distinction. Sections of the endosperm laid in absolute alcohol to remove the oil and to harden the alemone grains are observed in alcohol, and water is gradually added. In *I. verum*, the grains have a rough surface of glandular appearance; round or roundish grains are the rule; size 11 to 22 μ, averaging 12 μ. In *I. religiosum*, the grains are smooth, shining, oval or eliptical, seldom round, in size varying from 7.5 to 15 μ, averaging 11.5 μ.

A very reliable and easy chemical method of distinguishing them rests on the presence in the true anise, of anethol, and its absence in the false. The carpels to be examined are broken into small pieces, the seeds are removed and the remaining fragments of carpel are boiled in 1—2 cm. of alcohol for a few minutes until the liquid takes on a weak but distinct yellow color. The liquid is then decanted into another test tube and diluted with water. The false anise gives a clear fluid, while the alcoholic extract of the true star anise shows a milky turbidity due to the precipitating anethol. If these extracts are evaporated in watch glasses, the false drug gives beautifully developed crystals (of sikimic acid) in great abundance, while the true article gives only very small, indistinct crystals or yields sugar.

[Schweiz. Wochenschr. f. Chem. u. Pharm., 34, p. 278.]

The Spraying of Plants.

Nothing more remarkable has taken place in the history of botany than the development of methods for the protection of cultivated plants against the attacks of fungi and insects, especially by spraying, and the consequent encouragement given to the study of the life history of fungi. It is scarcely more than a decade since the first impetus was felt, its inception being traceable to the discovery of the value of Bordeaux mixture as a fungicide and Paris green as an insecticide. The former was first used in France and the latter in central United States. The importance of these discoveries cannot be overestimated, and the extent and variety of the practical and scientific results which have followed can only be fully appreciated by one studying the subject. It is therefore a valuable service which Mr. E. G. Lodeman has rendered to practical and scientific men alike by the publication of a work on the general subject of spraying.

In four hundred closely printed pages he has recorded a great number of facts and opinions, and given a clear survey of the growth of the subject and its present status. Beginning with the history and principles of spraying in general, he traces its rise and adoption in foreign countries and in America, together with improvements in machinery for its application; then discusses the action of fungicides and insecticides upon the parasite, the host, and the soil, and devotes the last third of the work to descriptions of fungous diseases and insect enemies of many kinds of plants, with directions for treatment.

There are several aspects in which the work is a specially valuable contribution to scientific literature. The chronological study of the subject in its different lines of development and from various geographical centers, with the abundant reference citations, presents a record of lasting importance, although necessarily limited by the size of the volume.

The fact that America leads in the study of plant diseases, in devising new remedies, perfecting those already known, and in the readiness with which the cultivator accepts and applies the suggestions of the investigator is cause for congratulation, as it augurs well for the continued growth of pathology and incidentally of other branches of botany in this country.

The number of diseases brought to light and the number of remedies suggested have been so perplexingly numerous that the cultivator and the investigator alike will welcome the part of the work dealing with specific diseases and their treatment. Although necessarily brief, it is sufficient for the guidance of the cultivator, and affords the student a needed survey of the field. It is fortunate that insects and fungi are examined with equal thoroughness in this work, as it gives an opportunity to compare the results of the labors of entomogists and mycologists. [Bot. Gaz. 22, p. 61.]

A Rare Preparation of Indian Hemp.

M. E. Lepinois reports a preparation of Indian hemp from Egypt that is seldom met with in commerce. It consists of somewhat elongated masses which may be smooth and fusiform or thicker and more or less furrowed transversely. These furrows indicate plainly that the mass when fresh is somewhat waxy and is moulded into shape in the hand. The color is brown with a greenish tinge. The odor is not marked but when fresh recalls that of calamus. It is only when heated that it gives the odor of Indian hemp. The masses weigh from 10 to 40 grams and have an average density of 1.338. The easily powdered mass when examined microscopically is found to consist of hairs imbedded in an amorphous yellowish or brown mass made up of glandular trichomes filled with resin. These hairs, sometimes entire, sometimes broken, have the structure characteristic of the *Cannabinaceæ*. They are unicellular and covered externally with small mammilose papillæ. They enclose near the base a resinous material similar to that which is distributed througout the mass.

At first sight the drug might be confounded with Ladanum, but the form of the hairs contained is decisive. Those of the *Cistaceæ* are multicellular and bear a gland at their extremity. A chemical examination showed the presence of a resin, brittle, with pronounced odor but lacking characteristic taste. It is completely soluble in alcohol, ether and bisulphide of carbon, insoluble in potash, soda and ammonia. It is little acted upon in the cold by acids.

The residue remaining after extraction with water and alcohol is composed in part of trichomes and in part of insoluble minerals. On incineration the carbonate and sulphate of calcium, peroxide of iron and silica were obtained. The results of the examinations were as follows:

Aqueous extract	10.80 percent.
Alcoholic extract	32.00 percent.
Insoluble organic matter	33.20 percent.
Ash	24.00 percent.

Egypt is not the geographic source of this drug: there the cultivation and importation of Indian hemp is forbidden by law. It is, however, smuggled in and sold by Armenians. In Syria the drug is cultivated and the resin prepared. Probably the specimens examined were from Syria; it resembles in aspect the product made in different points in Galilee and Asia Minor and called "chirros", a name closely resembling "churrus" employed in India for the resin of the Indian hemp. The "chirros" is a kind of confectionery to which hashish is added. Although the form of this preparation is here found no saccharine substance is present.

[Repert. d. Pharmacie (1896), June, p. 241.]

Economic Uses of the Agaves.

In a recent monograph on the Agaves of the United States by Dr. A. Isabel Mulford, some interesting facts concerning the uses to which the Indians of the Southwest put this rather forbidding-looking plant, are brought out.

The fibre is used in making sacks, ropes, saddlecloths and other articles. The softer parts yield food and drink as well as a soapy liquid used for washing. The flower stalks serve for fish poles and handles for lances and are important in building their habitations. Perhaps the best known product of the Agave is the Mexican national drink, pulque. At an age of about ten years when the plant is ready to send up its flowering stalk, a remarkable flow upward of the very sweet sap called *aqua de miel*, honey water, takes place. The central bud and leaves are cut out and a long cylindrical gourd inserted to receive the liquid. An average of three gallons per day for several months is furnished by a single plant. This is collected in vats made of rawhide, and allowed to ferment. The liquid becomes white, resembling half-turned buttermilk and acquires a strong yeasty odor, when it is said to be cool, refreshing, palatable and nutritious.

Agave Americana, *A. Mexicana* and *A. atrovirens* are especially used for this purpose.

By the distillation of the pulque the Mexicans make a fiery, intoxicating liquor going under a number of names, but most frequently known as *mescal*. The name *mescal* is likewise applied to an article of food much esteemed by the Indians of the Southwest. A large pit is prepared and lined with stones which are heated by a fire kept in the pit. When all is ready the Agave stems, from which all but the sweet, juicy stalks and young leaves have been trimmed, are heaped on the hot stones, covered with grass and earth and left to steam for two or three days. By this time all except the fibrous tissue is reduced to a palatable, nutritious, jelly-like mass. Dr. Havard says: "Cooking develops a large proportion of grape sugar which exists in combination with citric acid as a citro-glucoside. It is set free by exposure to heat or by application of cold water." He also says that the young leaves yield on pressure a juice which is slightly acidulous, laxative and diuretic, therefore a good antiscorbutic. The Apache Indians seek most eagerly after *A. Palmeri* [Pl. 1.] and *A. applanata* [Pl. 2.]. *A. Utahensis* is used by the Panamint Indians.

[Seventh Report of the Missouri Botanical Garden (1896), p. 58.]

Ainu Medicinal Plants.

The first part of the article on Ainu medicinal plants by Rev. John Batchelor and Dr. K. Miyabe, in part summarized in The May Review (p. 113) is continued. A number of additional plants and uses are worthy of note.

The young leaves of *Arctium lappa* L. after being softened by rolling them between the palms of the hands are applied to skin eruptions. They are occasionally used as an article of food after being boiled. A strong decoction of the bitter flower shoots of *Petasites japonicus* Miq. is taken for heavy colds and sometimes also used as food.

Artemisia vulgaris L. is used as a charm against evil, especially against disease and is frequently hung up in houses. The stem and leaves are boiled in a pan and the patient is made to inhale the steam by covering his head and the pan with a cloth.

Cynanchum caudatum Max. is used as both food and medicine. While good for any complaint, it is a special remedy for small-pox. When to wounds of all kinds a thick decoction is applied, the formation of pus is said to be prevented. Half cooked roots are said to have an intoxicating effect and to cause loss of all control over the limbs and to do away with all sensation of the skin. The root is dried and stored up for future use, but it is sometimes taken fresh, either roasted or boiled, and is said to have a very sweet taste. In time of epidemic sickness the root is chewed in its raw state and the juice blown from the mouth sometimes upon and over the afflicted person; sometimes all over the inside of the hut and through the doors and windows; and sometimes again about a house and even whole villages. When so used it is supposed to act as a kind of charm to drive away the demon of sickness. Those who use this plant so are generally intoxicated by it. It is also said to be very efficacious as an antidote to poison. It is used sparingly as a food and only when well cooked.

The decoction of the aromatic *Escholtzia cristata* Willd. is given to persons suffering from the after-effects of intoxication.

Daphne chinensis Lam. var. *brevifolia* is reported to be poisonous, especially the berries and the root. Some Ainu burn the roots to charcoal, powder and apply where there is internal pain, never to cut wounds.

The mistletoe, *Viscum album* L. is held by the Ainu, as by many other nations of northern origin, in peculiar veneration. As a medicine it is good for almost every disease, taken either in food or as a decoction. The leaves are preferable to the too sticky berries. It is believed to increase productiveness and hence the finely cut leaves are mixed with the millet and other seeds, and prayed over before sowing. A little is also eaten with the food. Barren women have been known to eat the mistletoe to cure them. Since the willow is regarded as a sacred tree, the mistletoe growing on this particular host is supposed to have the greatest efficacy. The fresh' bark of the willow, *Salix multinervis* Fr. et Sar. is widely used as an application for cut and bruised surfaces. The finely shredded bark is softened in hot water and bound to the wound.

The bark of *Populus tremula* L. cut into fine shreds is bound to wounds to prevent the formation of pus.

The resin of *Picea Japanensis* Fisch. is sometimes applied to cut wounds to hasten healing. The softened leaves of *Smilax herbacea* L. are applied to heal affections of the eyes; they are also applied to skin eruptions and wounds.

Allium victorialis L. is used especially for colds and is sometimes hung by doorways as a charm against epidemic diseases.

The rhizome of *Acorus calamus* L. is extensively used. The decoction is said to cure pains of the stomach. It is also used for colds and headache.

Polyporus officinalis Fr. grows on larches; it has a very bitter taste. It is rubbed into painful places; it is used in a decoction as a remedy for stomachache.

[Pharm. Journ., 56, p. 442.]

Indian Hemp.

In an editorial in the *Indian Lancet* for May 16th the writer gives a description of the effects of this plant, which is consumed in enormous quantities in the East. In small doses it quickly relieves pain and induces sleep. In larger doses it produces the following effects: Shortly after taking a full dose a pleasant state of intoxication ensues. The consumer perpetually talks, giggles, and sings. Ideas of a delightful kind pass rapidly through his mind, and he is possessed with a feeling of complete happiness and contentment. After a time sleep sets in, generally accompanied by pleasant dreams. But if the dose is excessive, or if the individual is peculiarly susceptible, the consequences are such as to prevent a repetition of the indulgence.

The following vivid description, says the writer, is given by Dr. H. C. Wood of the effects he suffered from an overdose of this drug: A few hours after taking it he was writing a prescription when he became perfectly oblivious to surrounding objects. He continued to write, however, and, on looking up and seeing the patient lying in bed, thought that he had been many hours writing the prescription, and he apologized for remaining so long. He then returned home in a state of ecstatic happiness. He laughed and made comic gestures and imitated the motions of a violinist. He knew he was acting foolishly but could not control himself. This condition lasted for half an hour, and then a change set in. He felt uneasy and his limbs became numb, and he walked constantly about the house. His mouth and throat became painfully dry, and he experienced a strange feeling in his legs, as though they were not a part of his body. A foreboding, an undefined, horrible fear, as of impending death, took possession of him, and he sent for a physician. He had lost all power of measuring time. When the physician arrived the patient was put to bed, but the symptoms grew intensified, and he felt himself mounting upward and expanding until he filled all space. He himself says, "I have never experienced anything like the fearful sense of almost hopeless anguish and utter weariness that was upon me."

This drug, continues the writer, is a native of Western and Central Asia, although it is cultivated in many parts of Europe. The Indian variety only is used in European medicine. It has two principal forms, one consisting of dried leaves and small stalks, which is called bhang or siddhi in Hindustani, and hashish in the Arabic tongue; the other consists of the flowering shoots, and is called guaza by London drug brokers.

Although hemp is such a powerful drug, it is said not to be fatal, even in the largest doses. The odor is rather pleasant and the taste scarcely preceptible, and for this quality, says the writer, it lends itself, like arsenic, to criminal purposes. In India it is smoked both by Mahomedans and Hindus, either alone or with tobacco. It is also taken as an infusion. The commonest way of using it, however, is in a sweetmeat of a green color, which is composed of flour and various ingredients. Although its usual effect is the production of quiet happiness, and although it is said, like opium, to diminish crime, it sometimes produces furious delirium and renders the consumer perfectly reckless. The assassination of Justice Norman, for instance, in Calcutta, on the steps of the town hall, was perpetrated by a man under the influence of hashish. The Afghan chief, also, who murdered Dr. Forbes, in 1848, was known to have been intoxicated for days previously with charas or bhang. When the drug is consumed for any length of time it produces trembling and great muscular weakness. And a strange effect of it, occasionally, is a most ravenous appetite, which no quantity of food is capable of appeasing. But the astonishing effects produced in the warm East are never seen in colder England.

The use of hemp, says the writer, may be morally indefensible, nevertheless it serves most useful purposes. Some intoxicant appears to be a necessary food for the human nervous system. Hemp is, therefore, an excellent substitute for alcohol among the totally abstaining Mahomedans. It also enables the over-populated Asiatic countries to pull through their frequent famines in a way that would be impossible with Englishmen. And if we judge by the inoffensive Hindu it can not be said to be morally deleterious.

The use of bhang is as old as the hills. The ancient Chinese herbal called Rh-ya, written about the fifth century B. C., notes that there are two kinds of plant — one producing flowers and seeds, and the other flowers only. Many early Hindu works on medicine also, such as the Susruta and Charaka, describe hemp as a potent remedy for certain ailments; while Herodotus states that in his time it grew in India, and articles of clothing were made from it. The Scythians, he said, were in the habit of using it in their baths. They placed the seeds on red-hot coals, and exposed their bodies to the vapor. Early in the Middle Ages the use of bhang spread from India through Persia to the Arabians, but it was not until the sixteenth century that it was introduced into Europe. It did not take there, however, and during Napoleon's eastern expedition it was described as a new discovery by two French scientists. Thirty years later, in consequence of Dr. O'Shaughnessy's experiments in India, hemp became a permanent and valued addition to the British Pharmacopœia. The famous care-destroyer of the Greeks was, according to Royale, nothing else than Indian hemp. It has furnished our language, continues the writer, with rather an ominous word — assassin, derived from hashishin, the name of a band of Mahomedans whose murderous deeds terrified the crusaders, and who were so called from the fact that they used hashish in their religious rites. As for stopping the use of bhang by a royal commission, the writer says, we might as well try to keep swallows from building nests. Considering the antiquity and universality of its use, it is impossible not to conclude that hemp is as necessary to the Mahomedan and Hindu as tobacco or beer is to the Briton. And the balance of evidence points to its comparative harmlessness.

Practical Pharmacy.

Filling of Capsules with Powders or Pill-Mass.

In a paper read before the Scientific Section of the American Pharmaceutical Association at the Montreal meeting, Mr. W. C. Alpers traced the history of the gelatine capsule and also discussed the filling of capsules with powders and pill-mass. Inasmuch as there appears to be a great lack of information as to the proper manner for filling capsules it may be best not to merely abstract the paper, but to give the second part of the paper in full. For the historical introduction consult the original.

There exists a great diversity of opinion as to the proper way of dispensing medicinal media in gelatine capsules. While some pharmacists claim that a mass should always be prepared, others contend that the only proper way is to fill the mixture of the various items of the prescription in powder form into the capsule. Under certain circumstances both may be right. Physicians are not always explicit in writing prescriptions and often omit to state in what form they wish the medicine administered. If they would simply add "*fiat massa in capsulas dividenda*," or "*fiant pulveres in capsulas dividendi*," all doubts would be dispelled. But there are only a few who do this, and as long as the modus operandi is left to the judgment of the pharmacist, a definite rule should be adopted.

The public in general prefer capsules filled with powder, and all pharmacists know the sometimes very troublesome customer who will insist on having his 20 grains of quinine put into ten capsules, because "they act better that way." The argument that a dry powder is more readily dissolved or absorbed than a more or less compressed pill, is a very plausible one and hard to refute. In reviewing prescriptions on which capsules are ordered, we find that the majority, almost 65 percent are orders for pills, that is to say, they contain ingredients whose mixture will result in a pill mass. Vegetable extracts of more or less soft consistency, oils of various natures, articles like oxgall or ichthyol, and similar drugs, all these can only be prepared in pill form; for to make powders of them would require an addition of so much absorbing powder, as to make the powders unreasonably large. To this class we must also count those prescriptions that contain deliquescent salts or such chemicals which by their mixture will turn moist or liquid. There can be no question about such prescriptions and our investigation is therefore restricted to prescriptions that are composed only of dry ingredients or in which the amount of liquid medicaments, like a few drops of some ethereal oil, is so small that it will be readily taken up by the solid ingredients without the addition of any absorbing powder. What is ordered in such cases, powders or pills?

Let us take analogous cases. Would a pharmacist think of changing a prescription for pills into one for powders, or one for powders into a liquid? Is it not the rule to dispense conscientiously whatever is ordered, and not alter a prescription in the least, unless the limits of safety have been transgressed? Why then should a mixture of drugs ordered in powder form be changed into a pill mass? A capsule is, according to all authorities, a cover for nauseating or strong smelling medicines, no teacher or encyclopedist restricts its meaning to pills alone. A pharmacist, therefore, has no right to suppose that a physician wishes to order a pill mass when he orders powders, especially as the prescriber has it in his power to add the words "fiat massa," and thereby express such desire if it existed. Where, however, such a remark is wanting, there is no reason why a mass should be formed. Powders, not pills are ordered to be put into capsules, and the pharmacist who changes the powders into a mass doubtlessly transgresses the limits of his professional liberties. And what other motive to do so can there exist, but the desire to save time and labor? The tendency of late years to prepare prescriptions at lower prices than all the competitors and sacrifice everything to cheapness, has reduced not only the time allotted to each prescription, but also the care and solicitude so necessary in the fulfillment of our professional duties. It is easier to make a mass and cut it into so many parts than to carefully weigh each powder, and let the accuracy with which the last powder balances the calculated weight serve as a proof of the correctness of all powders.

It is claimed that in many instances the bulk of the dry powder would necessitate a very large capsule, while a mass could be compressed to a much smaller volume. In answer to this argument we must not forget that it is not the pharmacist's province to regulate the bulk of the medicine, or to correct a physician, as long as the dose is within the limits of safety. If a physician chooses to order a mixture containing as a dose one-sixtieth grain of strychnine dissolved in a tablespoonful of some aromatic liquid, no pharmacist would consider it his duty to change the tablespoon to a teaspoon, and thereby reduce the bulk of this medicine to one-fourth of the prescription under the plea that the bulk of the dose was too large. If, therefore, the physician orders a powder to be put into capsules and the largest capsules alone will hold the prescribed dose, there is no reason why the pharmacist should change the order. Nor is it always true that a mass will reduce the bulk. In the first place it is always necessary to add some excipient, if it be only water, thereby adding to the weight; very often adhesive vehicles as gum acacia, tragacanth, various mucilages or glycerites are needed to form the mass. The danger of adding a little too much of a liquid vehicle, and then being compelled to correct the mistake by adding some solid, often increases considerably the bulk of the mass without adding to its medicinal properties. Furthermore, while all these ingredients may be perfectly harmless, if considered by themselves, they may yet change the finely comminuted powder to a hard lump, which instead of being easily assimilated by the patient would pass undissolved through the system or even be the cause of serious digestive disorders. Lastly, we may also state that although there are people who prefer small capsules to large ones, there are just as many who will take a large capsule as readily as a small one.

A few words may be added about the filling of capsules, which seems to be a difficult task to some pharmacists. Whenever a mass is first prepared, little difficulty is experienced. The general procedure is to roll the mass and cut it into the required number of pieces, in such a way that each piece has the shape of a small cylinder, of a diameter a little smaller than that of the body of the selected capsule. The operator should then wash his hands, in order to remove all traces of the mass, and then introduce the small cylinders into the capsules by means of a needle with which he picks them up. As especially fit for this work, I mention the small botanical needles used in dissecting flowers, which are provided with a wooden handle, an instrument that every pharmacist can prepare himself. The covers are afterwards put on with the fingers. By this method, the odor as well as the taste of the ingredients of the mass are thoroughly covered by the capsule. Care should be taken not to select too large a capsule, so that the mass after drying will fill only half the space; but even with the greatest care in preparing the mass a shrinking will afterwards take place, an inconvenience which it seems impossible to overcome.

During the last year, I have given this method of filling capsules my special attention and compared repeatedly the cylindrical parts of the mass by weighing them. In very rare instances have I found two parts that weighed exactly the same, the variation in my own work ranging from a fraction of 1 percent to 3 percent, in spite of the greatest care exercised. Experiments with masses cut by other operators showed a similar, sometimes worse, result: I have discovered two apparently equal pieces of the same mass to vary as much as 8 percent. In most instances this lack of exactness seems to be irrelevant, but we must admit that if we once allow a variation it is hard to draw a limit. I have therefore adopted a better and more correct method, and during the last six months, instructed my assistants to weigh the mass, divide the weight by the number of capsules ordered, and then weigh each part seperately before putting it into the capsule. Objection might be raised that this is a troublesome and tedious procedure. But this is not so. By using the metric weight a division is quickly made, and the weighing of from 12 to 20 small parts requires no longer time than the rolling and cutting.

To introduce powders into the capsules is not quite so simple, and requires a small apparatus to insure correct results. Some pharmacists resort to the rather crude method of putting the powder, without dividing it, on a piece of paper, taking the body of the empty capsule between the fingers in the left hand and the cover in the right, and fill both by shoving them through the powder repeatedly. This method which is even recommended in one of the newer works on pharmacy as the best means of filling capsules is objectionable in more than one respect. In the first place it is impossible to gauge the quantity of the powder that is thus introduced into the capsule, and repeated weighing of each capsule becomes necessary, until the correct weight is reached, sometimes after many trials. Secondly, the very object of the capsule is entirely ignored; particles of the mass will adhere to the outside, and neither taste nor odor of nauseating medicines can afterwards be entirely removed. A capsule filled with quinine in this manner will taste bitter no matter how often it is wiped after filling, and if the mass should contain such strong ingredients as asafetida or valerian, their odor can never be removed. The proper way, insuring correctness and elegance, is to weigh each powder separately, and introduce it into the empty capsule by means of a small apparatus, of which various kinds are in the market. There is Reymond's capsule filler, consisting of a block of wood with a number of sockets for the empty capsule, and a second block with a corresponding number of funnel-shaped receptacles; another instrument, the Davenport capsule filler, consists of a metal funnel for the capsule and a plunger. Both these and other apparatus have their advantages and drawbacks.

I have here an instrument which I think is an improvement on the others. It consists of a base (Fig. 2), with a number of small plugs, and a block (Fig. 1), with a corresponding number of holes into which the plugs fit; these holes are widened at the upper side into small funnels. At the sides are pegs as guides for the upper block, so that each hole will be exactly over each plug. In the center of the baseboard there is a metal rod with a thread for a screw-nut at the upper end; the nut for this thread is held on the upper side of the perforated block by an overlapping flange, and can be turned easily by means of a pair of wings. A short plunger (Fig. 3), concave at one end and convex at the other completes the apparatus.

The modus operandi explains itself. The two blocks are arranged so as to place the upper one over the lower one, the empty capsules are introduced and pushed by means of the plunger into the perforation until they touch the plugs; if necessary the upper block is lowered by means of the screw until the upper parts of the capsules are even with the funnel-shaped widening of the perforations; the powders, each one having been weighed, are put into the funnels and pressed down with the concave end of the plunger, leaving a small elevation over each capsule for the hollow of the cover. By a few turns of the nut the capsules are now partially raised out of their casings, high enough to put the covers on, these latter might be moistened inside with a trace of water by means of a camel's hair pencil, and thereby glued on. After the covers are put on, a few additional turns of the screw will raise the capsules entirely out of the casings.

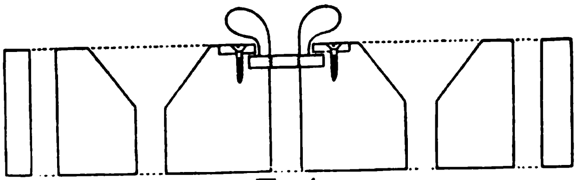

Fig 1

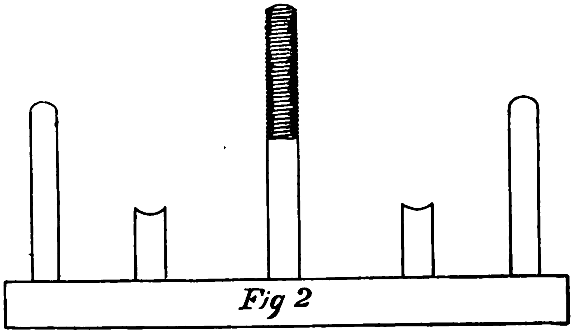

Fig 2

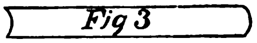

Fig 3

As a resumé I would submit the following rules:

1. Always follow the physician's directions as to the formation of a mass.

2. If no directions are given, form a pill mass whenever the ingredients cannot be mixed in powder form. Weigh the same, divide the weight by the number of capsules ordered, weigh each part and give it the shape of a small cylinder by rolling it between the thumb and first finger. Wash the fingers and introduce the cylinders into the capsules by means of a needle.

3. If no directions are given, and the ingredients of the prescription will form a powder, divide their combined weight by the number of capsules ordered, weigh each powder separately and introduce it in powder-form into the capsule by means of a convenient apparatus. Under no condition should the undivided powder be forced into the capsules, by moving the bodies and covers through the powder from opposite directions.

Physiology and Therapy.

Excretion of Ammonia in Disease.

In a number of cases of infective disease (pneumonia, typhoid, influenza, cholera etc.) the amount of ammonia excreted in the urine, as such, is increased. According to T. Rumpf the normal amount of nitrogen in the form of ammonia in the 24 hour's urine is given as varying from 0.4 to 1 gram. In the cases of disease examined, it varied from 0.8 to 6 grams. This condition passes off in an early stage of convalescence. The total nitrogen excreted is not similarly increased. On the average, there is an increase of 37 percent in the proportion of ammoniacal nitrogen to total nitrogen. The increase cannot be attributed to change of diet, but is explained as the result of the activity of miro-organisms. In cultures, addition of the bacilli of cholera and of other diseases causes a formation of ammonia.

E. Halleroorden, however, differs from Rumpf as to the conclusions drawn by the latter. He claims that the ammonia produced by bacteria would be converted into urea. Ammonia has, above all, in the body the function of an acid neutralizer; this is entirely neglected by Rumpf, who gives no estimation of acidity. The cause of the apparent increase of ammonia is doubtless to be sought in the alteration of the amount of acids produced by the fever.

[J. C. S., 70^{II}, p. 379; from Virchow's Archiv, 143, pp. 1 and 705.]

Anti-Vaccinationism.

The centenary of Jenner's demonstration of the utility of vaccination as a preventive of smallpox has been celebrated or neglected with more or less enthusiasm in various parts of the world. On the whole, it has received less attention from the profession and the public than the great importance of the subject and the high character and devoted services of the man have deserved. Co-incidentally the outbreak of an epidemic of smallpox at Gloucester, England, but sixteen miles from Berkeley where Jenner made his discovery, has exhibited on a regrettably large scale, the folly of the anti-vaccinationists. They are, or rather were, in great numbers in that town; but the disease spread so rapidly and was so fatal that most of those left alive were convinced by circumstances and have been vaccinated. We have not at this writing exact data at hand, so that we hesitate to state the number of lives that were meanwhile sacrified; but it was very large.

We confess to much sympathy with the good old British doctrine of the "liberty of the subject." There is no doubt that the modern tendency, as well in England as in America, is too much toward the imitation of European and Asiatic methods of paternal government. Unable to realize that a healthy social organism, like a healthy man, is in no need of medicine, our lawmakers devise one nostrum after another to improve the social welfare; and attribute the inevitably bad results of their interference to any cause but the true one. But in the matter of resistance to laws making vaccination compulsory, our English cousins are stretching a good doctrine too far. Vaccination is not for the protection of the individual only, but of his neighbors as well. If any one chooses to run the risk of sickening or dying with smallpox, he has an undoubted right so to do, so far as his mere personal welfare is concerned; but he has no right to expose his neighbors to the danger of being infected through him.

Accepting, therefore, as the standard of just government, its conformity with the law of "equal freedom," namely that "every one has the right to do as he wills, provided he infringe not the equal right of every other" — from which it follows that the sole function of government is to prevent one from infringing the equal right of another — we see that not compulsory vaccination but refusal to be vaccinated is a violation of justice. For refusal of vaccination by one impairs the ability of all others to protect themselves against the danger to life involved in the introduction and spread of pestilence. Under these circumstances the "liberty of the subject" is not invaded by compelling him to be vaccinated, and to have his children similarly protected.

Thyroid Preparations and Therapy.

The May number of the Therapeutische Monatshefte contain abstracts of the following articles on this subject:

1. Ueber jodhaltige Organismen und deren arzneiliche Anwendung. Von Prof. Erich Harnak in Halle. (Muench. med. Wochenschrift. 1896, No. 9.)
2. Ueber das normale Vorkommen des Jods im Thierkörper. (II. Mittheilung.) Von E. Baumann und E. Roos. (Zeitsch. f. physiol. Chem., Bd. 21, H. 5 u. 6.)
3. Ueber das Thyrojodin. Nach einem am 28. Febr. 1896 im Verein der Freiburger Aerzte gehaltenen Vortrage. Von E. Baumann. (Muench. med. Wochenschrift. 1896, No. 14.)
4. Beitrag zur Wirkung des Thyrojodin auf den Stoffwechsel bei Fettsucht. Von Dr. E. Grawitz. (Muench. med. Wochenschr. 1896, No. 14.)
5. Ueber Thyrojodin. Vorläufige Mittheilung von Dr. A. Hennig. (Muench. med. Wochenschrift. 1896, No. 14.)
6. Experimentelle Untersuchungen über die Bedeutung der Schilddrüse und ihrer Nebendrüsen auf den Organismus. Von Dr. S. Blumreich und Dr. M. Jacoby. (Berl. klin. Wochenschr. 1896, No. 15.)
7. Ueber die Behandlung des Kropfes mit Schilddrüsensaft. Von Prof. Dr. O. Angerer. (Muench. med. Wochenschr. 1896, No. 4.)

This list of articles clearly demonstrates the interest which this chapter of glandular therapy is at present enjoying. It is impossible to reproduce abstracts of all of these articles here. The brief historic sketch given by Prof. Harnack, however, may not be out of place.

Older medicine had many years before the discovery of iodine made a purely empiric use of marine plants and animals containing iodine in the treatment of glandular diseases: scrophula etc. Of fresh water organisms only few, such as *spongia fluviatilis*, approximate the marine organisms in percentage of iodine. Consequently these were used but little medicinally.

The first and oldest iodiferous drug is the charred sponge, *Spongia marina usta*, or more correctly *Spongia tosta*, prepared from the ordinary bath sponge. According to some authorities the crude bath sponge contains about 2 p.c. iodine. The fact that completely incinerated sponges contain less iodine than the charred sponge seems to indicate that the iodine is in organic combination. If the iodine in organic combination is more effective than the metallic iodide then this fact would be in harmony with the experiences of thyroid therapy.

Of other scrofula remedies of animal origin there might be mentioned: corrals, oyster shells and herring brine, cod liver oil and even pigeon dung, fat of snakes, the ash of the mole and the umbilical cord.

As to iodiferous remedies of vegetable origin the algæ should first be mentioned: *Fucus filum* and *vesiculosus*, *Sphærococcus confervoides*, the mixture known as worm moss or *thelminthocorton*, formerly used in Italy, the calcined *Laminaria saccharina* and *digitata*, used in India.

Of terrestrial origin tobacco ash was used formerly in struma and scrophula. Tobacco smoke is also said to contain iodine. Older medicine recommends a number of plants against scrofula: *Folia* and *Semen perfoliatæ arvensis*, *Folia rutæ murariæ*, *Fol. Senecii*, *Fol. vermiculani* or *Sedum minimum*, *Umbilicus Veneris*, *Radix Bardanæ minor*, *Radix Scrophulariæ*, etc. It would be of interest to ascertain whether these plants contain more iodine than other closely related ones.

The entire history of the application of iodiferous remedies is one of the most interesting in the history of medicine. Iodine in animal organisms was used therapeutically as many as 600 years ago, to-day medicine is coming back to its old practice. Formerly the iodine of lower organisms was taken, to-day that of highly organized ones is employed.

[Therap. Monatsh., 10, p. 280.]

Literary.

Books and Pamphlets Received.

Deutsche Verlags Anstalt — Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Dr. Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Illustrationen.

XIV. Abtheilung: Dunst — Eisenwolframlegirung. pp. 481—640. 1896. M. 5.00.

XV. Abtheilung (Schluss des dritten Bandes): Eiserne Brücken — Essigmutter. pp. 641—800. 1896. M. 5.00.

B. G. Teubner — Leipzig. Exkursionsflora für Nord- und Mitteldeutchland. Ein Taschenbuch zum Bestimmen der im Gebiete einheimischen und häufiger kultivirten Gefässpflanzen für Schüler und Laien. Von Prof. Dr. Karl Kraepelin, Direktor des Naturhistor. Museums in Hamburg. Vierte umgeänderte Auflage. Ein Bd., pp. XXVIII, 338. Mit über 500 in den Text gedruckten Holzschnitten. 1896. M. 3.80 geb.

—— Die verbreitetesten Pflanzen Deutschlands. Ein Uebungsbuch für den naturwissenschaftlichen Unterricht. Von Prof. Dr. Otto Wuensche, Oberlehrer am Gymnasium zu Zwickau. Zweite Auflage. Ein Bd., pp. 272. 1896. M. 2.40 geb.

—— Die verbreitetesten Pilze Deutschlands. Eine Anleitung zu ihrer Kenntniss. Von Dr. Otto Wuensche. Ein Bd., pp. XII, 112. 1896. M. 1.40 geb.

Friedrich Vieweg und Sohn — Braunschweig. Friedrich Mohr's Lehrbuch der chemisch-analytischen Titrirmethode. Von Dr. Alexander Classen, Prof. d. Chem. an d. Königl. technischen Hochschule, Aachen. Siebente umgearbeitete und vermehrte Auflage. Ein Bd., pp. XVIII, 906. Mit 191 eingedruckten Holzschnitten. 1896. M. 35.00.

Gebrüder Bornträger — Berlin, S. W. Zeitschrift für angewandte Mikroskopie. Mit besonderer Rücksicht auf die mikroskopischen Untersuchungen von Nahrungs- und Genussmitteln, technischen Produkten, Krankheitsstoffen etc. Erster Band. Herausgegeben von G. Marpmann. Ein Bd., pp. 390, sowie Lexikon der angewandten Mikroskopie. pp. 1—48.

Authors — On the toxic action of dissolved salts and their electrolytic dissociation. By Dr. Louis Kahlenberg and Dr. Rodney H. True, School of Pharmacy, University of Wisconsin. Reprinted from the Journ. of the Am. Med. Assn. Pamphlet, pp. 12. 1896.

Authors — Beitrag zur Kenntniss der aetherischen Oele. Ueber Palmarosaoel. Von Eduard Gildemeister und Karl Stephan. Besonderer Abdruck a. d. Archiv d. Pharmacie. Pamphlet, pp. 10.

U. S. Department of Agriculture — Washington. Crimson clover hair balls. By Fr. V. Coville, Botanist. Circular No. 8, Division of Botany. Leaflet, pp. 4.

Author — Silber und Silbersalze als Antiseptica in chirurgischer und bacteriologischer Beziehung. Vortrag von Dr. B. Credé. Pamphlet, pp. 8.

Author — 1.) Die Verwendung des Tannigen bei Diarrhoen der Kinder. Von Prof. Dr. Escherrich.

2.) Zur Anwendung des Tannigen bei chronischen Diarrhoen von Erwachsenen und Kindern. Von Prof. Dr. Biedert. Separat-Abdruck a. d. Therap. Wochenschr. Leaflet, pp. 4.

Author.—On the chemical composition of bismuth subnitrate. By Lyman F. Kebler. Reprint from Am. Journ. of Pharm. Fascicle, pp. 4.

Reviews.

Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Im Verein mit Fachgenossen herausgegeben von Dr. Otto Lueger. Dritter Band. Caciumoxyd bis Essigmutter. Mit zahlreichen Abbildungen. Deutsche Verlags-Anstalt — Stuttgart.

Although it is not everybody's business to be an engineer, yet the achievements of modern engineering are of interest to almost every one. A full appreciation of these achievements is not possible by reading newspaper accounts or even by seeing some of the modern wonders, which are no longer numbered. A good technical encyclopedia is to-day as necessary as a good atlas in a well equipped library.

The excellent work, of which the third volume has just been completed, is what it purports to be, a technical encyclopedia. Yet as its title indicates, the editor in chief, a civil engineer, takes no narrow view of the field covered by the German word "Technik." A brief classified enumeration of some of the larger articles will amply demonstrate this statement. Of general technical interest the following may be mentioned, many of which are well illustrated: Chronometer, Dachstuhl, Damm, Dampf to Dampfpflug, Decken, Deich, Dock, Draht to Drahtzugschranken, Drehbank, Druck, Dynamometer, Edelsteinschleiferei, Eisenbahn etc. Eiserne Brücken, Entstaubungsanlagen.

Architecture is represented by illustrated articles on chinesischer Baustil, Chor, Dorische Bauweise, Elisabethstil, Erker; Geology by the articles Erde, Erosion, Erz etc.; mining by illustrated articles on Deutsches Tunnelbausystem, Eiserner Grubenausbau, Elektricität im Bergbau, Englisches Tunnelbausystem.

Under physics attention should be called to the articles on Camera lucida and obscura, Dehnung, Deklinator, Dichtigkeit (with a table of specific gravities) Doppelbrechung, Elektrische Meerinstrumente, Elektricität und Energie; under chemistry to the derivatives of calcium from Calciumoxyd to Calcium sulfite, Chinin, Chlor, Chloral, Chloroform, Eisenverbindungen. Chemical technology is well represented by the articles on Cellulose, Ceresin, Dampfkochapparat, Desintegrator, Destillation, Dextrinfabrikation, Elektrolyse, Eisen, Eisengiesserei. Attention should finally be called to the sanitary articles on Desinfektion, Drainage, Entwässerung des Bodens etc.

It thus becomes apparent that aside from the articles on theoretical and applied mechanics, the mathematics of which will no doubt puzzle many a so-called engineer, the third volume, like the first and second, is replete with articles of interest to the general reader, who desires information on technical subjects. Typography and illustrations are excellent as in the previous volumes. With each new volume the work recommends itself more as one of the standard works of its class.

E. K.

Missouri Botanical Garden. Seventh Annual Report. Published by the Trustees, St. Louis, Mo. 1896. pp. 208, plates 66.

In addition to the report of the administration of the Garden and other matters of interest to one who follows the growth of this institution of unusual import to science in America, the volume in hand presents much of value to botany.

The Director, Dr. William Trelease, contributes a revision of the *Juglandaceae* of the United States. The descriptions, based on the winter characters of the trees drawn from bark, fruit, buds and twigs are of especial interest. The text is illustrated by twelve half-tone plates showing the growth-habit and the appearance of the bark. Leaf scars, buds and fruits are illustrated by thirteen plates made from drawings by Miss Grace E. Johnson.

Dr. A. Isabel Mulford presents a paper on the Agaves of the United States. This, since Engelmann's monograph (1875), is the only one devoted especially to our species and forms a valuable addition since our knowledge of the territory of which this genus forms a characteristic feature, has been much enlarged since that time. An interesting general account of the genus is followed by a chapter on the economic uses of the Agaves. A detailed description of the different forms is given. The article is illustrated by thirty-eight plates of which sixteen are half-tones, the remainder from drawings.

Mr. C. N. Thompson discusses the ligulate Wolffias of the United States in an article which is accompanied by three plates.

In addition to the scientific papers, the Anniversary publications also have place. An address by President Henry Wade Rogers on the Value of a Study of Botany comes under this heading.

The catalogue of the Sturtevant Prelinnean Library, reviewed elsewhere, closes the volume.

Rodney H. True.

Hilfstafeln zur Prüfung chemischer Präparate. Auf Grund der Pharmacopoeia austriaca ed. VII zusammengestellt von Dr. L. J. Panics, königl. serb. Militär Apotheker. Verlag von Josef Lafár, Wein. Ein Bd., pp. IV, 80. 1895. M. 1.80.

This little book, which as a pocket guide is to serve as a constant companion and counselor to the pharmacist, is largely an extract of the Austrian Pharmacopoeia. The chemicals of this pharmacopoeia are enumerated alphabetically and the tests are arranged in tabular form. In addition to the tests of the pharmacopoeia the author has added, wherever necessary, others, more especially among the specific tests for impurities. These are mostly tests which have been collected from the scattered sources of recent literature.

The text is supplemented by a list of reagents and abbreviations. The typography is good and the book leaves on the whole a favorable impression.

E. K.

Practical Methods of Organic Chemistry. By Ludwig Gattermann Ph. D. Translated by Wm. B. Shober Ph. D. McMillan Co. N. Y. One vol., pp. 329. 1896.

This is a book which should be in the library of every teacher of organic chemistry and one which will no doubt be of great value as a guide to students in their second year of organic chemistry. Its chief peculiarity and merit is in the great stress laid on practical laboratory work. The first one-hundred pages are devoted to a presentation of the general operations used in making organic preparations: crystallization, distillation, decolorizing, heating under pressure, etc., and of methods of organic analysis. The analytical methods are described clearly and illustrated by examples, with methods of calculation. The remainder of the book is taken up with experiments and theoretical work based upon them. The greater part of those general methods which lend themselves to laboratory work of a character not too difficult are clearly illustrated. Following each experiment in preparation-making there is a short discussion of the general principle involved and an indication of the scope and usefulness of the method illustrated by the experiment. It is preeminently a worker's guide, not a book for the class-room nor for reference except to gain knowledge of practical details. It is excellent in its place.

H. W. Hillyer.

Exkursionsflora für Nord- und Mitteldeutschland. Ein Taschenbuch zum Bestimmen der im Gebiete einheimischen und häufigen kultivirten Gefässpflanzen für Schüler und Laien. Von Prof. Dr. Karl Kraepelin. Vierte umgeänderte Auflage. Druck und Verlag von B. G. Teubner, Leipzig. 1896. pp. 338, mit über 500 in den Text gedruckten Holzschnitten. M. 3.80.

In this little work we have a book in which everything is subordinated to one end, viz. the identification and labelling of the plant and that by the most expeditious route. Consequently little significance is attached to the general arrangement of the families, modern ideas of a natural order being quite neglected. The descriptions are just sufficient to insure the probable correctness of the diagnosis. Words are saved and clearness increased by the plentiful use of small woodcuts throughout the book, showing contrasting structures. The copious glossary is in a like manner illustrated. Although the plan of the book is hardly such as to greatly illuminate the subject, criticism is somewhat disarm by the author's plain avow of but a single purpose and we are only left to question the wisdom of this purpose. If one desires a pocket volume convenient in size and neat in get-up by means of which the layman or the beginner can readily arrive at the name of a given plant, we are confident he can find none better, for the range to which it applies, than this.

Rodney H. True.

Die verbreitetsten Pflanzen Deutschlands. Ein Uebungsbuch für den naturwissenschaftlichen Unterricht. Von Prof. Dr. Otto Wünsche. Zweite Auflage. Druck und Verlag von B. G. Teubner, Leipzig. 1896. pp. 272. M. 2.40.

In this little book we have brought together, according to a reasonable system of classification (Engler's Syllabus, 1892), descriptions of the most widely distributed phanerogamous plants of Germany. By the free use of keys and by condensed descriptions confusion to the beginner through multiplicity of characteristics, some of them perhaps variable, is avoided and the size of the book kept within convenient limits. The clear type and the flexible linen binding add also to the ready usefulness of the book. Certain plants offering especial difficulty of identification in the body of the book are considered in an additional key in which leaf characteristics are mainly used.

For the use of beginners and for people who care only for the names and general relations of the common plants of Germany, this book must be of service. This is evidenced by the fact that a second edition is demanded within less than three years after a large first edition.

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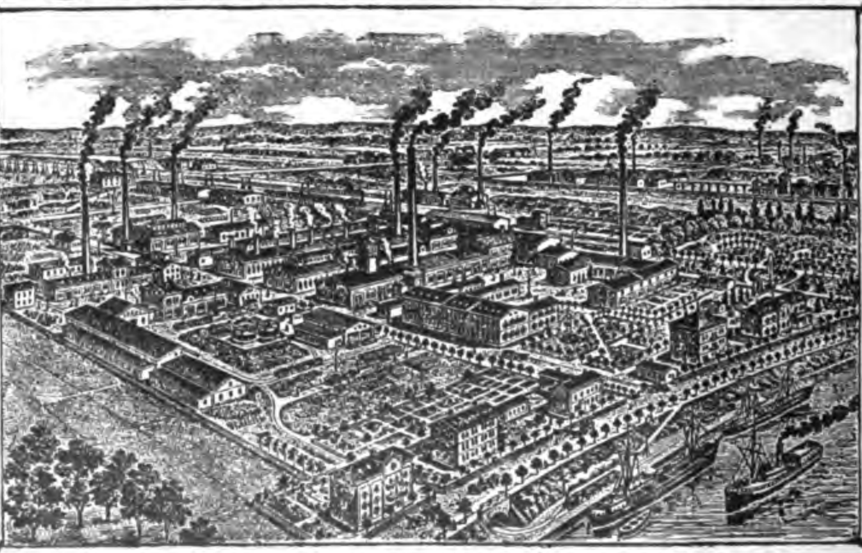

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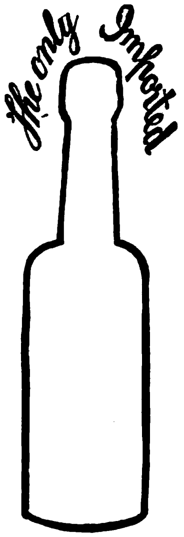

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SUPPLEMENT, SEPTEMBER 1896.

Universities and Colleges.

University of Illinois.

On Aug. 16, the chemical laboratory building of the University of Illinois, at Champaign was almost destroyed by fire. The damage to the building is estimated at $20,000 and to the contents at $50,000. The department will be in working order by the opening of the school year.

Massachusetts College of Pharmacy.

In addition to the older course a new course covering two academic years and modelled after the two years' course of the University of Michigan will be offered. The degree to be awarded is that of Ph. C. No practical experience will be required.

University of Chicago.

The corner stone of the Hull Biological Laboratory of The University of Chicago was laid July 3d, with appropriate ceremonies. An address was delivered by Dr. George L. Goodale, of Harvard University, upon "Some of the relations of the new natural history to modern thought and modern life," in which the speaker made a strong statement concerning the claims of biology to a place in educational schemes and also upon the community. Head Professor John M. Coulter officiated at the laying of the corner stone of the Botanical Hall and made a brief statement concerning the purposes of the building. In the evening the visiting biologists were entertained by The University at the Quadrangle Club House, where informal responses were called for by President Harper. Among the visiting botanists present were: Dr. Geo. L. Goodale, Harvard University; Dr. T. J. Burrill, University of Illinois; Dr. T. H. MacBride, University of Iowa; Dr. Charles R. Barnes, University of Wisconsin; Dr. G. F. Pierce, University of Indiana; Dr. C. F. Millspaugh, Field Columbian Museum. The accompanying cut will give some idea of the external appearance of the building, which will be ready for use in the spring of 1897.

Hull Botanical Laboratory.

Catalogues Received.

Atlanta Medical College—Atlanta, Ga. Annual Announcement. Session 1896—'97.

Baltimore College of Dental Surgery — Baltimore, Md. Fifty-seventh Annual Catalogue, 1896—'97.

Kansas City College of Pharmacy — Kansas City, Mo. Eleventh Annual Annoucement, 1896.

National College of Pharmacy — Washington, D. C. Twenty-fifth Annual Circular, Session of 1896—'97.

Scio College, Department of Pharmacy — Scio, O. Annual Announcement, 1896—1897.

University of Michigan, School of Pharmacy—Ann Arbor, Mich. Annual Announcement and Register of Alumni. Twenty-ninth year, 1896—'97.

Scientific Societies and Organizations.

Verein Deutscher Naturforscher und Aerzte.

The sixty-eighth meeting of the German Naturalists and Physicians will be held in Frankfurt on the Main, Sept. 21—26. Nine sections, representing pure science, pharmacy and medicine, will hold sessions. The programme of the section of Pharmacy and Pharmacognosy includes the names of Dr. Vulpius, of Heidelberg; Dr. A. Schneider, of Dresden; Dr. Kunge-Krause, of Lausanne; Dr. C. Hartwig, of Zürich; and Dr. Homeyer of Frankfurt. Among the general addresses will be one by Dr. J. H. van't Hoff, of Charlottenburg, on The Processes of Slow Oxidation; and one by Dr. E. Beckmann on The Determination of Molecular Weights.

Illinois Pharmaceutical Association.

The seventeenth annual meeting of the Illinois Pharmaceutical Association was held at Springfield July 28 and 29.

Among the most noteworthy points touched upon on the annual address of Pres. Sohrbeck were: satisfaction with the present pharmacy law and the opinion that its more complete enforcement would prove a decided benefit; recommendation of the druggists co-operative manufacturing company organized under the auspices of the Association, as placing a powerful weapon in the hands of the pharmacist with which to defend himself against the inroads of the patent medicine manufacturers; congratulation to the pharmacists of the state upon the acquisition by the State University of the Chicago College of Pharmacy; and the expression of a wish that the members would show their appreciation of this step by promptly responding to the invitation of the University to select an advisory board of pharmacists to assist in the management of the School of Pharmacy.

In accordance with this recommendation the following gentlemen were selected as nominees for the advisory board; Henry Biroth, Blue Island; A. E. Ebert, W. M. Sempill and Andrew Scherer, Chicago; Dr. H. H. Rogers, Kankakee; H. H. Green, Bloomington; Henry Swannell, Champaign; Thos. Knoebel, East St. Louis; Theo. C. Loehr, Carlinville; and Fritz Lueder, Peoria.

The election of officers for the ensuing year resulted as follows:

W. K. FORSYTH, Chicago, President; M. B. TRAVIS, Saybrook, 1st Vice Pres; W. H. GARRISON, Pearl, 2nd Vice Pres; H. H. SAWYER, Rockford, 3rd Vice Pres; T. S. ARNOLD, Watseka, Treasurer; FRANK FLEURY, Springfield, Secretary.

An invitation to the Association from the President of the University to meet at Champaign next year was accepted and June 15 and 16 were the dates fixed for the meeting.

Missouri Botanical Garden.

The recent tornado at St. Louis was so destructive that much anxiety was felt by botanists as to the fate of the Missouri Botanical Garden. In the absence of Dr. Trelease, Mr. C. H. Thompson, Acting Director, has furnished the following statement to the editor of the Botanical Gazette:

"The Garden was in the direct path of the storm, at the very beginning of the territory destroyed, and received less injuries than the region east of us. However, the damage done in the Garden is very considerable, the most of it being in the arboretum, where something like 160 trees were either uprooted or broken off near the ground, so that they had to be taken out. These, of course, were total losses. Something over 250 were badly damaged. In many cases the tops of the trees were almost entirely carried away. Many of these, by judicious pruning, will in a few years grow to be beautiful trees again, while many are so badly broken that it is probable that they will die. The shrubbery was badly whipped and broken, but fared better than the trees. The bed plants were almost totally destroyed in the exposed parts of the grounds. However, these are now replaced. The wreckage from the trees is rapidly being gathered up, and the Garden promises by another month to be as beautiful as ever, with only the vacant places here and there to remind us of the ravages of the storm.

Buildings suffered somewhat. The Linnean house, which shelters the palms in the winter season, had the glass portion of the roof entirely demolished. The office building had the tin roof torn from the south wing, and other buildings escaped with slight damages. At the office building, where the library and herbarium are kept, no damage whatever was done to the contents of the building. No permanent damage was done to the Garden, and most of it can be repaired in a short time."

Biology and the Dept. of Agriculture.

The following editorial from the July number of the Botanical Gazette is of interest and calls for no comment.

"The establishment of a biological survey by the Department of Agriculture, under a recent act of Congress, should mark the beginning of a new era in the botanical field-work of the United States. Some work of this kind has been done by the general government, and by different institutions, but it has been desultory and without any general plan. At the head of the new survey no more competent man could have been placed than Dr. Merriam, for his whole work has tended in this direction and his publications have shown a wide grasp of the problems. To be made most effective, large cooperation must be obtained from local organizations, which will work along definite lines in a general plan. The natural allies of the Department will be the Experimental Stations already established in every state, but even these should not be regarded as adequate. Where state biological surveys are organized, these should be associated with the government survey and work under its general direction; and where they are not, such organizations should be formed, or the biologists of the state should individually associate themselves with the general survey. There can be no doubt that abundant and important service can be suggested to every worker by Dr. Merriam. The new survey should prove a great stimulus to the coming generation of botanists, and to the strong movement in botany which is impelling them to emerge from herbaria and laboratories and to come in contact with the larger problems of plant-life. The gradual shifting of the botanical standpoint is becoming daily more evident, and the period of morphology is merging into one to be dominated by physiology, not merely the chemistry and physics of physiology, but the larger field of ecology.

"The movement for the appointment of a scientific chief of the department of agriculture seems to have received a check, whether through its friends or enemies we are not informed. But as it has received already the cordial endorsement of a considerable number of the foremost scientific men and societies, it is to be hoped that it will yet be carried to success. What may be the condition in other lines of scientific work we do not know, but we do know that under the present division of labor in botany there is a dissipation of energy and a duplication of work that might be largely avoided under a more logical and consistent organization, such as could probably be secured by a wise and broad-minded scientific executive. Now that the head of the department holds a cabinet portfolio, it is out of the question to expect other than a political adviser of the President to be appointed. If under him there were a permanent chief, empowered to organize and harmonize all the scientific divisions as the president of a university directs its policy in consultation with heads of departments, we should find increased economy and efficiency of every division. Under the present conditions there is a division of botany, a division of agrostology, a division of forestry, and a division of vegetable physiology and pathology. It is needless to point out the absurdity of the naming of these divisions, which have been split off one by one from the original division of botany. Each now is wholly independent of the other in control, appropriations, quarters and equipment. There is a force of live young men in these divisions and a very great amount of work is done, on whose high quality we have had occasion frequently to comment. There should be a chief of the division of botany, with general direction of all botanical work; the present "division of botany should be rechristened, while it and the other botanical divisions should be made sections, each in charge of an assistant chief. This would make it possible to concentrate the office and routine work so that each chief would be left freer to push the work of his section. There can be no doubt that under some such plan we should see even more important advances in pure and applied botany than have been possible under the present system."

American Pharmaceutical Association.

The following skeleton report of the sessions of the Montreal meeting, held Aug. 12th to 18th at the Windsor Hotel, may serve as supplement to the editorial on the the first page of this number.

First General Session, Wednesday afternoon. The association was called to order by President Good of St. Louis. He introduced Mr. R. W. Williams, president of the Quebec Pharmaceutical Association, and Mr. W. H. Chapman, president of the Montreal College of Pharmacy, who wellcomed the visitors. Prof. E. L. Patch of Boston accepted for the association. Vice President Charles E. Dohme assuming the chair, President Good delivered his annual address. He commented on the work of the committee on the status of the pharmacist in the U. S. Army and Navy; the committee on the metric system; the National Formulary; the two queries discussed by Dr. Chas. Rice, chairman of the Committee of Revision, at Atlanta;[*] the question of free alcohol; and the International Pharmaceutical Exhibition to be held at Prague, Austria.

The evening was pleasantly spent in the parlors of the Windsor Hotel, a reception being tendered the visitors by the Pharmaceutical Association of the Province of Quebec and the Montreal College of Pharmacy.

Second General Session, Thursday morning. The report of the nominating committee was received and the persons, whose names were recommended, elected. President, J. E. Morrison, Montreal; first vice-president, G. F. Payne, Atlanta, Ga.; second vice president, W. A. Frost, St. Paul, Minn.; third vice-president, G. W. Parisen, Perth Amboy, N. J.; treasurer, S. A. D. Sheppard, Boston; secretary, Chas. Caspari, Jr., Baltimore; reporter on the progress of pharmacy, C. L. Diehl, Louisville, Ky.; members of council for a three-year term, C. E. Dohme, Baltimore; J. M. Good, St. Louis; J. P. Remington, Philadelphia.

Reports were made by the treasurer, the secretary, the reporter on the progress of pharmacy and the chairmen of various committees.

The short **General Session** was held in the afternoon previous to the session of the commercial section. A detailed report of the committee on national legislation was read.

The **Commercial Section** was then called to order by Chairman Geo. J. Seabury.

The chairman read his address and Mr. E. A. Robinson read the only paper presented to the section. It was an answer to query 8: "Are non recent preparations, in imitation of well-known domestic medicines, legitimate products; and is it honest for a dealer to allow his name to be printed on a label so as to give an unknown compound currency, when he is ignorant of the contents of such preparation? Why does he not prepare his own family and household remedies?"

A report from Mr. Holmes, editor of the Mortar and Pestle, was read explaining the history of this short lived publication of which only four numbers appeared.

The officers elected for the following year are: Chairman, S. C. Hopp, Cleveland, O.; secretary, E. D'Avignon, Windsor, Ont.; associates, G. Mennen, Newark, N. J.; John F. Patton, York, Pa.; W. L. De Woody, Pine Bluff, Ark.

Inasmuch as there was no business for a second session of this section, as scheduled, the members were free to witness the fête nuit at Boucherville.

A **Fourth General Session** was held Friday morning to dispose of several business items. After adjournment the **Scientific Section** was called to order by Chairman S. P. Sadtler, who read his address. This was followed by the reports of committees.

The report of the special committee on indicators used in the volumetric estimation of alkaloids was practically a continuation of last years' report, and evoked considerable discussion.

The report of the Committee on the U. S. P. was merely read at this meeting.

The report of the committee on special research was received and steps were taken to assure for it greater permanency and usefulness.

The afternoon being given over to sightseing, viz. an electric car-ride through Montreal and its suburbs, the second session of the **Scientific Section** was not called until the evening. The following officers were then elected: Chairman, W. C. Alpers, Bayonne, N. J.;

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[*] 1. Shall a table of average doses of drugs and preparations be given in the Eight Decennial Revision of the U. S. Pharmacopœa?
2. Shall a selected list of new, synthetic remedies be introduced into the same work?

secretary, Virgil Coblentz, N. Y.; associates to be selected by these gentlemen.

The report of the committee on the U. S. P. was now taken up in detail and discussed freely. A large number of recommendations were referred to the committee on special research, others to the section of Materia Medica and Pharmacy of the Am. Med. Ass'n. for joint consideration by both professions.

The first paper read was that on "The caffeine compound in kola" by J. W. T. Knox and A. B. Prescott; the second that on "Taraxacin" by L. E. Sayre.

Recess was then taken until the following morning, when a paper on "Poisonous Honey" was read by L. F. Kebler. The first session was then adjourned.

The **Fifth General Session** was quickly disposed of Saturday morning.

The third session of **Scientific Section** was then called to order. The following papers were read:

"Canada potash", by T. H. Reed.
"Gelatine capsules", by W. C. Alpers.
"The destructive distillation of linseed oil", by S. P. Sadtler.
"Mixtures of solids for internal use", by C. S. N. Hallberg.
"Alcohol as a source of error in the titration of alkaloids", by Chas. Caspari, Jr.
"History and names of *Rhamnus Purshiana*", by J. U. Lloyd.
"Strophanthus seeds", by S. E. Jelliffe.
"The Menthol Group, IV",
"*Monarda punctata*", } by Edward Kremers.
"*Monarda fistulosa*",
"Products of the U. S. P.", by C. T. P. Fennel.
"Valuation of wild cherry bark", by A. B. Stevens.
"Antitoxine", by H. K. Mulford.
"What is the nature of dietetics employed in modern medicine and pharmacy", by F. E. Stewart.
* "Antitoxine", by C. T. McClintock.
* "Salol in salicylic acid", by Fr. Hoffmann.
* "Determination of phosphoric acid in soluble ferric phosphate, U. S. P.", by W. A. Puckner and F. Julian.
* "Pepsin", by C. C. Sherrard and J. S. Tegarden.
* "Pepsin standard of the U. S. P.", by C. C. Sherrand.

The **Section on Education and Legislation** held its first session Saturday afternoon. Chairman C. S. N. Hallberg read his annual address and secretary Beal his report. Papers concerning the character of state board examinations were read by H. B. Mason, C. S. N. Hallberg and H. M. Whelpley. The afternoon was spent in a lively discussion of these papers.

The second session of this section was called to order in the evening. The present officers were reelected.

The following papers were read:

"Duty pharmacists owe to their unregistered apprentices", by G. M. Whelpley.
"To what extent should a candidate for registration in pharmacy be required to be familiar with the subjects of microscopy and volumetric analysis", by T. H. Reed.
"A comparative exhibit of poison and pharmacy laws in the United States", by J. H. Beal.
"Oddities in pharmacy laws", by J. H. Beal.
"Is the sale of liquor by druggists necessary or should it be prohibited", by H. M. Whitney.
"Practice versus theory", by S. P. Watson.

Several other papers were read by title or in abstract. The section adjourned without holding third session as scheduled per programme.

Sunday was devoted to rest and Monday to a trip through the Lachine Canal, Lake St. Louis and the Lachine Rapids. The final **General Session** was held Tuesday morning and the usual routine of general business was disposed of.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
California	San Francisco	Oct. 14	John H. Dawson, San Francisco.
Kansas	Emporia	Sept. 9	W. C. Johnston, Manhattan.
Massachusetts	Boston	Oct. 6	F. H. Butler, Lowell.
Minnesota	Minneapolis	Oct. 6	H. G. Webster, Minneapolis.
Missouri	St. Louis	Oct. 12	F. W. Sennewald, St. Louis.
Montana	Great Falls	Oct. 7	G. W. Shoenecker, Billings.
Ohio	Cleveland	Oct. 13	W. R. Ogier, Columbus.
Oklahoma	Oklahoma City.	Oct. 6	B. E. Howendobler Perry.
Rhode Island	Providence	Oct. 5	W. E. Cates, Providence.
South Dakota	Huron	Oct. 14	I. B. Kiethe, Lake Preston.
Washington	Spokane	Sept. 21	W. H. T. Barnes, Seattle

Bibliography.

With the July number, the first of the twenty-second volume, the *Botanical Gazette* appears in its new form. The size has been increased to about eighty pages and other improvements in dress give the page a somewhat luxurious air. The three editors, Professors J. M. Coulter, C. R. Barnes and J. C. Arthur have enlisted the co-operation as associate editors of Prof. George T. Atkinson of Cornell University, Prof. Volney M. Spalding of the University of Michigan, Prof. Roland Thaxter of Harvard University and Prof. Wm. Trelease of Missouri Botanical Garden. The *Gazette*, while financially supported by the University of Chicago, as is evident by its changed appearance, is in no way the organ of that University or of any other, a situation guaranteed by the number and distribution of its editorial staff.

The Scientific American celebrated its semi-centennial by putting forth a special 72-page number. This issue is devoted mainly to the presentation of the advance in science and invention during the last fifty years. The historical articles on particular inventions, such as the sewing machine, the phonograph, the telephone, the reaper, the bicycle, etc., are valuable sources of information, and are illustrated with cuts of great interest. Attempts to sum up the progress of sciences like physics and chemistry in the limits of a two-column article are necessarily less successful, but may perhaps be of some value to a casual reader. Among other special features is a prize essay on The Progress of Invention for the Last Fifty Years, by Edward M. Byrne, A. M. The mechanical work on the Scientific American is always excellent, and this number is no exception.

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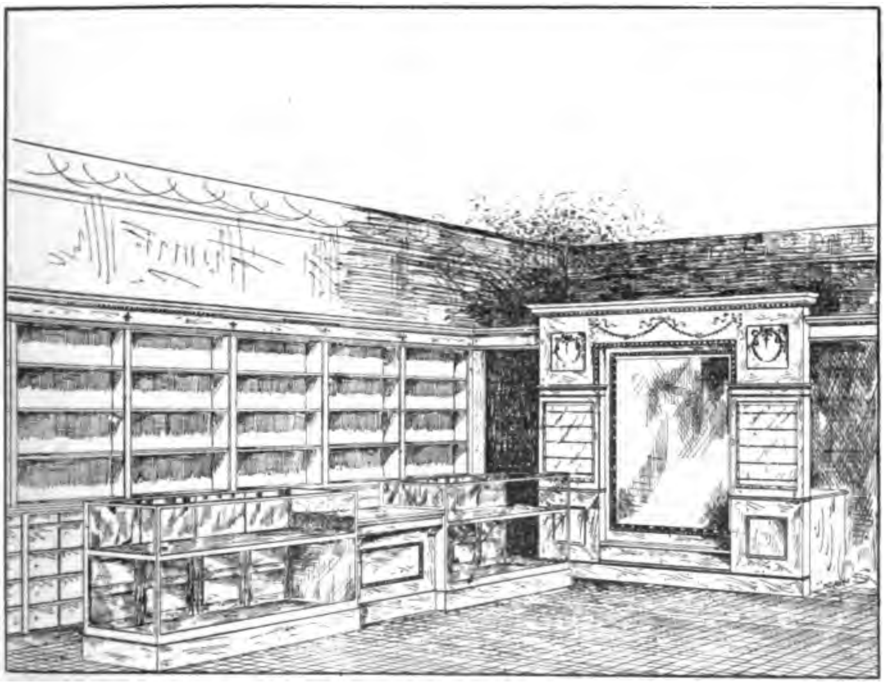

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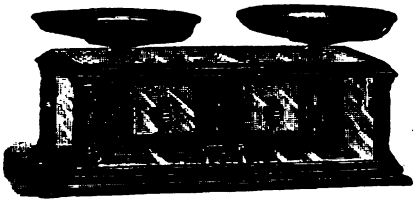

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Redigirt von Dr. A. HILGER,
Professor an der Universität München.
—— Zehnter Jahrgang. Das Jahr 1895. ——

Verlag von Herman Heyfelder—Berlin.

Chemisch-technisches Repertorium.
Uebersichtlicher Bericht über die
neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie.
Herausgegeben von Dr. Emil Jacobsen.
——34. Jahrgang.——
Mit in den Text gedruckten Illustrationen. 1895.

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 10. **OCTOBER, 1896.**

SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

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Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An illustrated Monthly Journal.

Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY

DR. FREDERICK HOFFMANN AND DR. EDWARD KREMERS.

WITH THE CO-OPERATION OF

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.

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EDITORIAL.

The International Pharmaceutical Exhibition at Prague.

August 15th to September 15th.

Americans are used to pharmaceutical exhibits on a scale and of a variety which can only be expected and realized in a country where the character and the scope of the retail drug-trade are so unlimited and where pharmaceutical manufacturing industries in all their legitimate branches as well as in their side issues are of such an extent and magnitude—and it may be added, of such a perfection—as in the United States. The continental standard and the authoritative restriction of the apothecary, strictly discriminating between the responsible pharmacist and the far less responsible retail-druggist, confine the practice of pharmacy to its legitimate application and resources, impressing upon the "Apotheke" the stamp of an official scientific institution in the domain of public sanitation. Pharmaceutical exhibitions in continental Europe seem to be in strict conformity with this principle and consequently to apply only to legitimate objects of the traditional "Apotheke". They do not aim to offer that vast and almost unlimited variety of products and of all kinds of goods and commercial commodities which make up the wondrous stock of the American drug-store and which are offered for sale and dispensed in the unique variety-shop of the average American retail-druggist.

Yet to this rule the present pharmaceutical exhibition at Prague makes a progressive exception, inasmuch as it, in the variety and the character of many of its exhibits, much more approaches the American prototype, including for instance wines, liquors, perfumes, soaps, proprietaries, surgical appliances, etc. But it surpasses this by far in the more scientific and historical character of several large groups of exhibits. It may therefore be justly stated that the so-called Second International Pharmaceutical Exhibition at Prague by its magnitude, by the great mass and variety of exhibits and by its most tasteful arrangement in the magnificent structure in the Ausstellungs-Park in Prague, is a great credit to its originators, its exhibitors and to the aims, the accomplishments and the enterprise of Austrian pharmacy and its pharmaceutical and collateral industries.

The Allgemeine Oesterreichische Apotheker-Verein inaugurated the first so-called International Pharmaceutical Exhibition in 1883 in Vienna. This venture proved a satisfactory success. The Pharmaceutical Society of Prague concluded last year to signalize the commemoration of its 25th anniversary by the arrangement of a second equally comprehensive pharmaceutical exhibition in Prague in the fall of 1896. This project met with general approval throughout the province of Bohemia and the Austrian Empire. The society was fortunate enough to secure for the exhibition the magnificent Industrial Palace erected some years ago in one of the beautiful public parks of the historical and wealthy grand capital of Bohemia, in the *Král Obova* at Prague. The Executive Committee, consisting of pharmacists, scientists, physicians, university-professors and citizens of Prague, has succeeded in realizing within a comparatively brief time a large, comprehensive and in several respects most valuable, instructive and unique exhibition—unique particularly in its collections of historical literature and documents and rare treasures of old handiwork and implements relating to pharmacy and medicine, hidden away for centuries in the vaults and libraries of monasteries and mediæval castles. Another unique but modern and appropriate feature of the display was the comprehensive representation of hygiene and bacteriology in their manifold direct and indirect applications to medicine, surgery and public and personal sanitation.

The exhibition in Prague differed, moreover, in several respects considerably from the pharmaceutical shows as we are used to see them at the occasion of the annual meetings of the American Pharmaceutical Association. It is equally comprehensively stocked with the customary outfit of a prescription-pharmacy with all its appliances and requisites, of the pharmaceutical, the analytical, the bacteriological laboratory; it contains a vast assay of the crude drugs, of galenicals and other pharmaceutical preparations and of chemical products of every description used or sold in pharmacies and the drug trade. Fluid extracts, coated pills, tablets, all kinds and forms of plasters, ointments and surgical dressings are represented in great numbers and variety and to perfection. In this respect the exhibition at Prague indicates considerable progress in continental manufacturing pharmacy aiming at that degree of perfection and reliability long since attained by the much grander manufacturing industry of the United States.

The exhibition at Prague, however, far surpasses our customary American displays in the prevalence of literary and historical exhibits of great value and interest. The museums, libraries and vaults of the castles, monasteries and of the old guilds of Prague and Bohemia, some with a historical record of nearly a thousand years, seem to hide a vast array of literary and art antiquities, of all kinds of implements, and of manuscripts and documents of every description relating to the art of healing in all stages of its slow evolution. Many of these documents seem almost unknown to the present generation and surely form a most valuable array of sources for the student of the history of medicine and pharmacy. From this large und unique collection of historical documents, displayed under the bright roof of the Exhibition Palace at Prague, but a few of the exhibitors may be mentioned in order to indicate where these historical treasures may be found scattered far beyond the realms of pharmacy: The Archives and National Museums of Prague; the Prince-Archbishop of Bohemia; the Prince of Schwarzenberg at Wittingau; the Prince of Lobkowitz; the Monastery of the Benedictine monks at St. Margareth; the Convent of the Præmonstratence Brotherhood at Strahov; the Convent of the Benedictines at Lettowitz in Moravia; the Convent of the Brothers of Mercy at Prague; and various libraries and museums of state, municipal or private institutions in Bohemia and adjoining provinces.

This historical part of the exhibition at Prague includes, besides literary documents, manuscripts, medals, apparatus, instruments and all sorts of appliances and utensils from mediæval to more recent times, whole prescription-pharmacies and pharmaceutical and alchemistic workshops as represented in Dr. Hermann Peters' well-known Pictorial History of Pharmacy. Next to the great collection in the Germanic National Museum at Nuremberg, the present exhibition at Prague may have offered one of the most comprehensive and unique exhibits of rare historical documents ever presented to the student of the history of pharmacy.

Another novel feature of a pharmaceutical exhibition was the creation of a botanical garden on a small scale on the grounds of the beautiful park, in front of the Exhibition Palace. A large number of officinal plants, grouped as much as possible in their natural orders, had been planted early in spring and under proper care had developed very well. The collection is quite representative and instructive and well supplements the great array of herbaria and botanical illustrations and the extensive pharmacognostical exhibits from the museums of the Allgemeiner Oesterreichischer Apotheker-Verein at Vienna and of the Pharmaceutical Society of Prague, exhibited inside the building.

Without entering upon any description of details, the scope and the character of the Pharmaceutical Exhibition at Prague may be recognized by enumerating the main groups in which the objects of the entire exhibition have been arranged in the official catalogue, issued in two languages, the German and the Bohemian.

Group 1. Scientific apparatus, applied in pharmacy and its practice.
" 2. Pharmaceutical literature.
" 3. Machines, appliances, apparatus etc., applied in pharmacy and pharmaceutical manufacturing industries.
" 4. Complete outfits of pharmacies and store-rooms.
" 5. Drugs, pharmaceutical preparations and chemical products of every description as pertaining to pharmacy.
" 6. Literature, documents, apparatus, appliances, implements, works of art etc., illustrating the historical evolution of pharmacy.

Group 7. Special exhibits of pharmaceutical corporations and societies.

" 8. Hygiene and the care of the sick.
  - a. Domestic hygiene, water-supply, ventilation, bathing, illumination.
  - b. Personal hygiene. clothing, nutrition, foods and drinks, cosmetics perfumes.
  - c. First help in emergencies, hospitals, army and navy, industrial hygiene.
  - d. Public instruction in hygiene, school-hygiene, gymnastics, disinfection, bacteriological and microscopic preparations for demonstration.
  - e. Balneotherapy, mineral springs, watering places, climatic sanitaria.

The total number of exhibitors, including those whose applications for space were too late to permit their names to be mentioned in the official catalogue, was about 568. These were distributed among the groups as follows: In group 1 — 18 exhibitors; in group 2 — 90 exhibitors; in group 3 — 18 exhibitors; in group 4 — 53 exhibitors; in group 5 — 102 exhibitors; in group 6 — 60 exhibitors; in group 7 — 8 exhibitors and in group 8 — 221 exhibitors.

The United States were represented by but one exhibitor from St. Louis in group 2, and England by 5 exhibitors in the same group.

This brief outline may suffice to give some idea of the scope and the character of the Second International Pharmaceutical Exhibition at Prague. Its arrangement was the more a tasteful and systematic one as the grand Exhibition Palace offers a vast amount of space and excellent light. Therefore both the exhibition as a whole and the various groups with all their individual exhibits made a most favorable impression. If there was any drawback worth mentioning it was the far too general use of the Bohemian language for inscriptions and descriptive signatures. This ill-applied show of sectionalism was certainly a considerable detriment to the full appreciation of the grand exhibition and was justly deplored and criticised by all visitors from outside of Bohemia.

The term "International" has as yet not met with any good luck in anything pharmaceutical. In congresses and in all efforts to create an "International Pharmacopœia" it has proved a misnomer from the early congresses at Brunswick and St. Petersburg to the recent farce at Chicago in 1893. The so-called International Pharmaceutical Exhibitions in 1883 and in 1896 have been no exception to this experience. Both have been fair and successful representative displays of the status and the advance of pharmacy, both in their respective countries and in general, and both have been a great credit to their organizers and patrons, and in particular to pharmacy and the pharmacists of the glorious Austrian Empire.

Fr. H.

The Rule of Thumb in State-Board Examinations.

At the Montreal meeting of the American Pharmaceutical Association the greater portion of an afternoon was given to the discussion of state-boards and state-board examinations. It was a spirited session and, no doubt, many of those present derived some benefit from the ventilation of opinions if not from the personalities indulged in by some. Whereas numerous matters of detail were discussed at length, some of the more general as well as most important features were left almost if not wholly untouched.

The following abstract from a recent editorial in the Nation may serve as a parallel illustration and at the same time as an introduction to what the writer has to say with regard to the rule of thumb in the official pharmaceutical examinations as conducted in this country. There are exceptions, but these exceptions merely go to proove the rule.

> "The Society of the Army of the Tennessee determined last year to erect an equestrian monument to Gen. Sherman, and a committee was appointed for the purpose. Conscious, apparently, of their own want of skill and experience in the matter of judging sculpture, they very properly asked four leading sculptors and a prominent architect to aid them in making a selection among the designs for which they had advertised. In this they followed the admirable example of Mr. Burnham at Chicago. He summoned the leading American artists, and asked them to make designs of exhibition buildings and divide the work among themselves. The world knows the result. In other words, he acknowledged that the men who give attention to a thing, and win fame in doing it, especially in matters of taste, are most likely to be right in their judgment about it.
>
> "We have said in 'matters of taste,' but this is really true in all matters. Civilization is built on, and progresses on, the idea that men who occupy themselves with any pursuit are likely to know more about it than those who do not, and that their advice touching that pursuit is good to take. This is true of war, of literature, of science, and of art in all its branches, of small things as well as great, from arranging a dinner table to fighting a battle.
>
> "The five artists thus selected promptly complied with the request of the committee, and went to Washington, where they passed judgment on the designs there collected, selected two as of more merit than the others, and recommended that further competition between the authors of these two should be ordered. They acted without compensation, for the honor of Gen. Sherman and the credit of American sculpture. This advice was given, they say, 'in the clearest way, and

with every precaution to guard against misunderstanding.' Far from taking it, the committee promptly proceeded to call for further competition between, it is true, the two recommended by the judges, but also between two others, one of whom had already been specially disapproved, or not at all approved, by the judges. Worse than all, when the award was finally made, it was made, without communication with the judges, to that one of the two supplementary competitors whose model in the first competition was not considered by the committee of experts as worthy of consideration."

American druggists sometimes find themselves in the position of the war veterans. Complaint has been made by members of the Am. Pharm. Ass'n. and of other pharmaceutical associations that the pharmaceutical professor is altogether too deeply interested in his scientific pursuits and takes too little interest in the every-day well-being of the pharmacist.

There are two kinds of pharmaceutical professors: first, those who know everything and can even give "tips on advertising," "how the druggist should treat his customers" etc.; secondly, those who simply prefer to be teachers and investigators, but would on the whole leave business matters to those who are competent and successful business men.

Nevertheless American druggists have sometimes had occasion to ask the assistance of the second class. Educational institutions have now and then been founded upon consultation with and even with the assistance of such men. They have been placed in charge of educational institutions and have used their best judgment in the arrangement of courses of study. Yet the very class of men that has called upon such persons for counsel, has been ready to hastily denounce the plans proposed or carried into effect by those who had not appointed themselves, but who had been called because they were considered competent to fill the positions to which they were elected.

The university or college professor is as a rule elected to his position because he is supposed to possess at least some capacity as a teacher. This implies that he is likewise supposed to be able to conduct an examination. Yet a university or college professor as a member of a state-board of examiners is a very rare bird. Indeed, if a person dares to suggest, as the writer did,* that examinations in chemistry should be conducted by a teacher of chemistry, those in botany and pharmacognosy by teachers of the respective sciences, and that the examinations of a more practical nature should be conducted by experienced practicing pharmacists, he is pointed to as a most dangerous heretic. What were to become of our beloved pharmacy if university or college professors were to conduct a part of the state-board examinations. These men, evidently, are to be considered as the worst enemies of pharmacy and are not to be entrusted with duties for which their lifework eminently fits them.

The Am. Pharm. Ass'n. yearly sends lists of queries to its members, including the college professor. The query as to how state-board examinations can best be conducted occurs again and again. If the college professor replies to such queries, his expression of opinion, therefore, cannot be considered uncalled for.

At present most of the members of state-boards are appointed by the governor, names for such appointment being submitted to him by the state association. If in each state a list of names of those who have been nominated by their state association were prepared, and an investigation could be made how many of these had been elected because they were considered especially competent to conduct examinations, the percentage, no doubt, would be almost ridiculously small in most states. It would appear that fitness to conduct examinations, possibly the principal duty of state-boards, received little if any consideration in the minds of the voters. A person may be a "nice fellow," or even a good and successful druggist, but this is no reason why he should be elected to conduct examinations.

If it were possible to get an honest answer from governors why they selected the person of their choice, it would no doubt be revealed that their motives were largely of a political character. Indeed, this has so generally been construed as a fundamental axiom by druggists that a democratic nominee has no expectation of being appointed by a republican governor and vice versa. In fact, druggists as a class rest under the fatalistic belief that the appointment of members of the board is so largely a matter of machine politics both in the association and by the governor "that there is no use in trying to do anything."

In this country everybody is supposed to know not only his own, but everybody else's business, everybody except the college professor. He is not only frequently criticized for what he teaches, but in some states at least he cannot even be elected for nomination by the state association unless he is at the same time a practicing pharmacist. It is true this rule has been violated, but as far as the writer is aware, not in favor of the college professor.

A reaction, however, is setting in. In politics civil service reform has made considerable headway in recent years, even in positions that were created and construed by machine legislators to be of a confidential nature and therefore not open to competitive examinations.

For three generations pharmaceutical education has rested largely in the hands of business men. No one questions their work as pioneers. The institutions founded by them are now seeking affiliation with broader educational institutions. The affiliation by name only, which some of them seek at present, will not suffice; they must become related as to educational methods and in spirit as well before any other gain than that of advertisement can be had. A quiet revolution to this effect is now in progress and by the time the oldest college can celebrate its hundreth anniversary, the union of pharmaceutical education with that of the universities bids well nigh to be complete.

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* [p. 9.]

This will do away to no small extent with petty, rivalry and the university professor, who in many instances is already an officer of the state, will no longer be eyed with that suspicion which now creeps out when the appointment of such men on state examining boards is suggested. His independent position will enable him to use his best judgment for the benefit of the people and of pharmacy in the state in which he lives. The criticism that the university professor is apt to be "ultra theoretical" and therefore not a fit person for state-board examinations need not be discussed at present.

With good reason we look to older European countries for advice in many matters, particularly those of an educational nature. Whether we look to France, to England, or Germany, we will find that in the appointment of examiners the state as a rule selects those men to conduct examinations, who by virtue of their training and position are considered best prepared for such work, and in all of these countries the pharmaceutical teacher occupies a prominent position on the examining boards.

Not a few Americans are like the Chicago preacher who gave the lie to an European critic, who, at the time of the World's Fair, had ventured to publish the statement that only a small percentage of the streets of that city are paved. When the critic furnished figures from municipal reports, he was informed that he was wrong nevertheless, because it was necessary to consider that Chicago was a young and rapidly growing city.

Why not frankly admit that in the rapid growth from barbarism to civilization our institutions have not been born perfect but are in a process of youthful development. No one will be so foolish as to demand that radical changes be made to-day or even to-morrow. American pharmacy is to-day largely what American pharmacists themselves have made it. Possibly at no time in the future will the rank and file of our calling do so much for the development of our profession as they have done during the past twenty-five years. If we are not to come to a stand-still or even to retrograde, the practicing pharmacist must be alive to every interest pertaining to our calling. If pharmaceutical examinations are to mean more in the future than they do to-day it will be of but little avail to discuss a host of minor details as long as there is something fundamentally wrong in the system. A calling is honored so far and only so far by the public as it takes part in its internal improvements and makes the interests of the public identical with its own. *E. K.*

ORIGINAL CONTRIBUTIONS.

Quantitative Estimation of Phenols in Volatile Oils.

Thymol and Carvacrol.

By *Edward Kremers* and *Oswald Schreiner*.

(Report of Research Committee G, U. S. P. Revision.)

Of the large number of volatile oils containing phenols but a few have been subjected to examination for the purpose of quantitative estimation. As the value of these oils often depends very largely if not almost entirely upon the phenol they contain, it is evidently of the utmost importance to the purchaser to know the amount of the phenol present. This was early recognized by dealers in volatile oils, yet a satisfactory method for estimation has been wanting. The first difficulty experienced lies in the weak chemical properties of the phenols themselves. They are mostly liquid, and crystalline derivatives are not always readily to be obtained from them, especially not in the presence of the other oily constituents. A few years ago a method for the estimation of thymol in oil of thyme was put forward. It consists in shaking a known volume of the oil to be estimated with a five or ten percent caustic potash solution; the volume of the oil that is dissolved by the alkaline solution gives the percentage of phenol present. It was soon noticed that the results varied with the strenght of the alkaline solution, as well as with the quantity of solution with which the oil was agitated. Furthermore, when such an alkaline solution of the phenol is diluted with water, a lower percentage of the phenol is always found. These facts clearly show that the alkaline solution removes also other constituents of the oil. An old resinified oil, for instance, will give up much if not all its resinous constituents to the potash solution, and the oil will therefore show a much higher phenol content. From these considerations it is evident that this solution method gives only a rough approximation and is only of value for comparative tests. Nevertheless, the method has been used and it certainly was a step in the right direction as it has at least retarded the pernicious practice of willful adulteration and placed the quality of thyme oil upon a firmer basis.

In attacking this problem of the quantitative estimation of phenols in volatile oils, it seemed best to pay attention, for the present, only to the substitution products. Of these the iodine compounds are the most stable and easily made. Whilst the iodine compounds of some of the phenols are well known and quite readily obtained from the pure phenols, yet it is quite another matter to obtain them from such complex mixtures as volatile oils. The first consideration was to ascertain whether the reaction is strictly a quantitative one. Messinger and Vortmann* found that thymol could be estimated volumetrically with iodine solution. The method consisted in dissolving the thymol in an alkaline solution so that 4 mol. of alkali were present for every mol. of thymol and then adding an excess of 1/10 normal iodine solution. The thymol is precipitated as a dark reddish brown iodide. The excess of iodine added was ascertained by slightly acidifying the solution, making up to a certain volume, filtering off a portion and titrating with 1/10 normal sodium thiosulphate solution. Every mol. of thymol requires four mol. of iodine. It was essentially this method, somewhat modified, that was used in making the experiments cited in the following report.

Estimation of Thymol.

Messinger and Vortmann used 4 mol. of alkali to every mol. of thymol. In working with an oil containing an unknown quantity of thymol this ratio cannot be obtained. The oil under consideration may contain 5 p. c. thymol or it may contain 50 p. c., hence the quantity of alkali to be added is unknown. By experiment it was found that a moderate excess of alkali could be used. Slightly different results were, however, obtained when a dilute solution of alkali was used, the results coming out slightly higher. The method of titration was the same as Messinger and Vortmann's except that an excess of alkali was always employed.

Strength Alkali.	Thymol used.	Thymol found.	Percentage.
5 p. c.	0.1500 gram	0.1504 gram	100.30 p. c.
5 "	0.1500 "	0.1496 "	99.76 "
2 "	0.2000 "	0.2035 "	101.73 "
2 "	0.2000 "	0.2038 "	101.92 "

With the 5 p. c. potassium hydrate solution the results come out very satisfactory and it was this strenght of alkali that was used throughout the following experiments. A large excess of iodine must be avoided as secondary reactions will take place resulting in a compound richer in iodine. How to avoid this, and other details of the method will be described later.

To estimate the thymol in volatile oils a known quantity of the oil was repeatedly shaken with a 5 p. c. potassium hydrate solution until all thymol had been removed. The amount of thymol in the alkaline solution was then determined by titration with iodine solution. In order to compare this method with the solution method before described the volume of oil that remained after shaking out the phenol was always noticed. For this purpose a Mohr burette with glass stopcock, graduated to 1/10 cc., was fitted with a glass stopper at the top, so that the oil could be shaken with the alkaline solution. The oil was diluted with an equal volume of a light boiling fraction of petroleum ether. The advantage is that the alkaline solution is not as likely to dissolve the other constituents. The separation of oil and aqueous solution is also much more rapid and complete. After separation had taken place, the remaining volume of oil could be read off accurately. The alkaline solution was then allowed to run off into a graduated flask and the remaining oil treated with fresh solution. This operation was repeated until all thymol had been removed. By proceeding in this way both methods could be applied to the same quantity of oil at the same time. The method in detail is as follows:

Method for the Estimation of Thymol in Volatile Oils.

From a weighed flask of oil pour out about 5 cc. into a glass stoppered burette graduated to 1/10 cc. Weigh the flask again; the difference gives the weight of oil used for the experiment. Add about an equal volume of petroleum ether and then note the volume of the mixture carefully. A little water can be added so as to bring the oil up to the scale of graduations on the burette. Now add the 5 p. c. potassium hydrate solution and shake vigorously for a short time, then allow to stand until separation is complete. Note the decrease in the volume of the oil and allow the alkaline solution to run into a 100 cc. graduated flask. This operation is repeated several times, until no further decrease in the volume of the oil takes place, or better still, until the oil no longer shows Flückiger's test for thymol. To make this test put a few drops of the oil into a test tube, add about twenty drops of chloroform and a small quantity of solid NaOH and apply heat. If thymol is still present a red color will appear. When all the thymol has been removed notice the volume of the remaining oil carefully. The difference between the volumes of oil before and after shaking with the alkali gives the volume of thymol dissolved. From this the percentage of thymol by volume is readily calculated.

The alkaline solution of thymol is made up to 100 or 200 cc. as the case may require, using the 5 p. c. alkali as the diluent. To 10 cc. of this solution in a graduated 500 cc. flask is added 1/10 normal iodine solution in slight excess. The thymol is precipitated as a dark reddish-brown iodine compound. In order to know when a sufficient quantity of iodine has been added, remove a few drops from the flask to a test-tube containing some dilute hydrochloric acid. When sufficient iodine is present the color of the solution shows the presence of iodine, otherwise the liquid is milky due to the separation of thymol. The solution is now made slightly acid with dilute hydrochloric acid and diluted to 500 cc. From this 100 cc. are filtered off and the excess of iodine determined by titration with 1/10 normal sodium thiosulphate solution. The number of cc. required, multiplied by five, and deducted from the number of cc. 1/10 normal iodine added gives the number of cc. of iodine required by the thymol.

$$C_{10}H_{14}O + 4I + 2NaOH = C_{10}H_{12}I_2O + 2NaI + 2H_2O.$$

Every cc. 1/10 normal iodine solution equals 0.003741 gram thymol. Knowing the quantity of thymol in the alkaline solution the percentage in the original oil is readily found.

Mixtures of pure thymol with pure limonene and pure cymene respectively were made and subjected to the above method of estimation with the following results:

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* Ber. 23, p. 2753.

Thymol dissolved in:	Quantity present.	Quantity found.	
		Iodine method.	Solution method.
Cymene..........	25.00%	24.92 p. c. 25.34 "	28.00 p. c.
Limonene......	25.00%	25.25 " 25.60 "	30.00 "

It is clear that the potassium hydrate solution in the presence of thymol dissolves some of the other constituents, thus making the percentage of thymol by the solution method higher than it ought to be.

Having obtained satisfactory results with thymol further experiments were made with its isomer, carvacrol. It was found that the separation of the iodide as a flocculent precipitate was far more difficult than in the case of thymol where separation takes place immediately. Further, the iodide formed is not as stable in the solution as is that of thymol; even slight acidulation with hydrochloric acid produces some changes on standing. For these reasons slight modifications in the method are necessary.

Method for the Estimation of Carvacrol in Volatile Oils.

The shaking out of the carvacrol from the oil with 5 p. c. alkali solution is the same as that of the thymol. To 10 cc. of the alkaline solution in a graduated 500 cc. flask 1/10 normal iodine solution is added. To avoid a large excess of iodine the same test as for thymol is applied. The iodide of carvacrol is precipitated as a white, finely divided precipitate, giving the solution a milky appearance. By shaking the solution for a short time the precipitate becomes flocculent, leaving the solution clear or nearly so. Now dilute to 500 cc. and filter off 100 cc. Acidulate the filtrate with hydrochloric acid and titrate the liberated iodine with 1/10 normal sodium thiosulphate. The calculation of the percentage is the same as that for thymol. Every cc. of 1/10 normal iodine equals 0.003741 gr. carvacrol. This method for carvacrol differs from that of thymol only in that the separation of the iodide has to be induced by violent shaking and in that the iodide is removed by filtration before acidulating.

Several estimations of oils have been made. The results are given in the following table.

Oil.	Sp. Gr.	Iodine Method.		Solution Method.	
		Thymol.	Carvacrol.	Thymol.	Carvacrol.
Thyme..........	0.949	56.16 55.78	—	65.00	—
Monarda fistulosa...	0.935	—	58.48 58.00	—	70.00
			58.20 58.40	—	70.00
Monarda fistulosa...	0.927	—	53.34 53.66	—	64.50
			54.46 54.26	—	65.50

From these figures it will be seen at once that the solution method gives figures that are entirely too high, and they also show that the result is not even an approximate one. It is somewhat simpler, yet in the hands of one who has even but a slight knowledge of volumetric analysis the iodine method ought certainly not to prove difficult. The results obtained by using an oil of known thymol content certainly show this method to be far superior to the solution method. The iodine method has been used in this laboratory by students with only a moderate experience in quantitative work with good results. Further trials are now in progress.

These experiments on the estimation of phenols in volatile oils are being continued. At present eugenol and the oils containing it are under consideration.

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On the Chemical Composition of the Oil from Monarda Punctata (L).

By *Wm. R. Schumann* and *Edward Kremers*.

Introduction.

In a paper on the chemical composition of the volatile oil from *Monarda fistulosa*[1] one of us called attention to the fact that although examinations of four specimens of *Monarda punctata* have been recorded, none of these specimens are authentic.

In 1846 an oil of horsemint supposed to be derived from *Monarda punctata* was examined by Arppe[2]. In 1888 an examination of oils supposed to be obtained from *Monarda punctata* was made by Mr. Schroeter[3]. One sample of oil was taken from the cabinet of the Philadelphia College of Pharmacy where it had been standing for six years, during which time it had deposited crystals of thymol. The other two specimens were evidently obtained in the open market, from reliable sources.

However, for none of the four specimens of oil heretofore examined is there any positive guarantee given as to their source. Arppe separated mechanically a crystalline stearopten, evidently thymol which had been deposited upon standing. Schroeter states that the oil contains a hydrocarbon of the formula $C_{10}H_{16}$; thymol "which is dextrogyrate;" a compound $C_{10}H_{18}O$, boiling between 240°—250°; and formic, acetic and butyric acids.

The oils used, the methods employed, as well as the description of some of the results, e. g. the rotatory power of the optically inactive thymol, did not inspire confidence.

Some of these odd statements have crept into the literature of volatile oils. Thus Bornemann[5] calls attention to the supposed difference in rotatory power between thymol from oil of thyme and that from *Monarda*. He also mentions that the thymol from fresh monarda oil is noncrystallizable, whereas the crystallizability of the thymol increases with the age of the oil.

Experimental Part.

In view of the interesting results obtained upon examination of the oil from *Monarda fistulosa* obtained from authentic material and of some of the discrepancies that have crept into literature on the subject, another examination seemed called for.

The material from which the oil was obtained was collected early in August near Pine Bluff, about fifteen miles west of Madison, and was identified by Prof. L. S. Cheney of the University of Wisconsin.

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[1] Proceedings American Pharmaceutical Association, Vol. 43, p. 256. 1895.

[2] Pharmaceutische Rundschau, Vol. 13, p. 207. 1895. Annalen d. Chem. u. Pharm., 5, 8, 41.

[3] American Journal of Pharmacy, p. 113.

[5] Die Flüchtigen Oele, p. 372.

The flowering herb was distilled with water vapor while still fresh, about one-half of a pound of oil being obtained. The oil is of an amber or light yellowish color with a pleasant yet characteristic mint-like odor, sp. gr. 0.9307 at 20°. It turns the plane of polarization $+0.05479$ to the right at 20°, hence $[\alpha]_D = +0.0588$.

Separation of Phenol.

In order to remove the phenol the oil was shaken with 10 p. c. caustic soda solution.

(1) From 25 cc. of oil shaken with 50 cc. of the soda solution, 14 cc. went into solution or 56 p. c. phenol.

(2) A duplicate experiment gave identical results.

(3) From 150 cc. of oil shaken with 350 cc. of soda solution, 84 cc. went into solution or 56 p. c.

The alkaline solution of phenol was distilled with water vapor to remove any non-phenol portion of the oil that might have gone into solution. The solution was then acidulated with sulphuric acid and the distillation continued. The distilled oily phenol was dried with exsiccated sodium sulphate and exposed to the temperature of a winter's night, when it solidified to a crystalline mass. The melting-point of the dried almost colorless crystals was found to be 50°. With chloroform and caustic soda it gave the characteristic reactions of thymol and carvacrol. The melting-point, however, excludes the latter.

Non-Phenol Constituents.

That portion of the oil which was not dissolved by shaking with 10 p. c. soda solution was distilled with water vapor. 79.3 grams of oily distillate were obtained. This was dried. Inasmuch as the original oil had been shaken only once with caustic soda, the oily distillate still gave a reaction for thymol when tested according to Flückiger[4] with chloroform and caustic soda solution. This reaction, however, is very delicate and would indicate traces of the phenol.

The oil deprived practically of thymol had a sp. gr. of 0.887. In a 100 mm. tube it turned the plane of polarized light 1.7166° to the right. Upon fractionation the following fractions were obtained:

78°— 88°	3.5 cc.
88°— 98°	1.75 cc.
98°—166°	about 7.0 cc.
166°—172°	4.0 cc.
172°—178°	13.0 cc.
178°—186°	0.5 cc.
186°—202°	6.0 cc.
202°——	———

Fraction 172°—178°.

It was shown by Mr. Brennan a year ago that the oil of *Monarda fistulosa* contained cymene. The large yield of this fraction suggested the possibility of the presence of this hydrocarbon in this closely related oil. In order to ascertain its presence or absence, 7 cc. of this fraction were heated with a dilute solution of 30 gm. of potassium permanganate until the color disappeared. The solution was then filtered and evaporated to dryness, the residue then dissolved in water and acidulated with sulphuric acid. A dense whitish precipitate was formed. After recrystallization from alcohol the melting-point was found to be 155°—156°, which is that of oxycumic acid, thus proving the presence of cymene.

Fraction 186°—202°.

On account of the small amount of this fraction, a combustion only could be made in order to ascertain the probable presence of linalool or a similar body.

(1) 0.1372 g. of substance gave 0.1340 g. H_2O = 0.01488 g. H. and 0.4145 g. CO_2 = 0.11304 g. C.

(2) 0.13089 g. of substance gave 0.1285 g. H_2O = 0.01427 g. H. and 0.3749 g. CO_2 = 0.1101 g. C.

(3) 0.1289 g. of substance gave 0.1322 g. H_2O = 0.0149 g. H. and 0.3809 g. CO_2 = 0.10388 g. C.

	Calculated for $C_{10}H_{18}O$.	Found. I.	II.	III.
C.	77.92%	82.39%	78.08%	80.6%
H.	11.69%	11.84%	11.25%	11.6%
O.	10.37%	6.77%	10.67%	7.8%

These results do not agree very well, nor can the fractions after but one fractionation be considered pure. The amount of oxygen, however, makes the presence of some oxygenated substance like linalool probable.

* * *

May 31st of this year about 30 pounds of young plants not yet in blossom were collected near Arena, Wis., by Prof. Cheney. From the partly dried herb about 118 grams of oil or 3.39% were obtained by distillation with water vapor. The oil possessed a slightly reddish color and had a sp. gr. of 0.925 at 20°. The rotatory power could not be taken on account of the dark color of the oil. A volumetric estimation of thymol was made.[*]

1. (a) 4.4580 grams of oil were diluted to 13.0 cc. with petroleum ether and shaken with 5 p. c. soda solution until the volume of the ether solution remained unchanged and thymol was no longer indicated by Flückiger's reaction.
   Loss of volume, 3.0 cc.=61.22% phenol.
   (b) Alkaline solution of thymol diluted to 100 cc. with 5 p. c. soda solution.
      (α) 10 cc. of this solution required 73.5 $\frac{N}{10}$I solution for precipitation of phenol, hence 75.3 × 0.0037415 = 61.68% thymol.
      (β) A duplicate test gave identical results.
2. (a) 5.7887 g. diluted to 13.3 cc. lost 3.9 cc., hence 61.9% phenol present.
   (b) Alkaline solution of thymol diluted to 100 cc. with 5% soda solution.
      (α) 10 cc. required 95.0 $\frac{N}{10}$I V. S. for precipitation of phenol, hence present 61.4% thymol.
      (β) A duplicate test gave identical results.

Table of Results.

	Shaking out Process.	As Thymol Iodide.
Exp. 1	61.22%	61.68%
Exp. 2	61.9 %	61.4 %

Pharm. Chem. Lab., Univ. of Wis.

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[4] F. A. Flückiger, Reactionen, p. 156.

[*] For the details of this process compare The volumetric estimation of phenols by E. Kremers and O. Schreiner.

History and Names of Rhamnus Purshiana (Cascara Sagrada).[*]

By *J. U. Lloyd.*

Contribution of the Research Committee of the American Pharmaceutical Association.

In a paper contributed to New Preparations[†] October 15th, 1877, p. 8, the late Dr. J. H. Bundy, an eclectic physician of Colusa, California, commended "Cascara Sagrada" as a valuable remedy in the treatment of constipation. This notice was by means of a brief note that was part of a paper on Berberis aquifolium, Dr. Bundy promising, however, to give it further attention as follows:—

"It is not my purpose to treat on Cascara Sagrada in this paper but using it in connection with the Berberis, I simply make mention of it. In the future I will introduce this drug to the profession."

This, so far as the writer can determine, was the first reference concerning this remedy in pharmaceutical or medical print. Agreeable to promise, in January, 1878,[‡] Dr. Bundy contributed a paper on the subject "Cascara Sagrada" in which he gave the uses of fluid extract of "Cascara Sagrada". Following this came many papers from Dr. Bundy and other physicians, twenty contributions on the subject being printed in New Preparations, 1878, to which journal with few exceptions the subject was confined during 1877 and 1878. Dr. Bundy stated in his paper (1878) that "A description of the Cascara I am unable to give at this time, but suffice it to say that it is a shrub, and in due time its botanical name will be known." He neglected, however, to concern himself further in the matter.

In the fall of 1878, Dr. C. H. Adair, of Colusa, California, a partner of Dr. Bundy, sent the writer specimens of the bark and botanical specimens of the tree or shrub yielding it. These on identification by Mr. Curtis G. Lloyd proved to be Rhamnus Purshiana. This fact was announced in a paper on Some Specimens of Western Plants, presented to the American Pharmaceutical Association, held in Atlanta, Ga., November, 1871 (Proceedings, 1879, p. 707), and completed the drug's history.

Names.

Dr. Bundy supplied the drug under the Spanish name "Cascara Sagrada", which name is said to have been in local use throughout some sections of California, and soon came to be the common name of the drug. It will surely dominate all others as long as the drug is in use. The anglicised name "Sacred Bark" has also been applied to the drug, and the Scriptural term Chittem Bark was also employed in early days in some parts of California, but these last names are now obsolete.

Summary.

To Dr. J. H. Bundy, Colusa, California, 1877, is due the credit of introducing the bark of Rhamnus Purshiana (Cascara Sagrada) to the medical profession.

To New Preparations, Parke, Davis & Co. of Detroit, Michigan (1877 and 1878), is due the credit of bringing the drug to the attention of physicians and pharmacists.

To Parke, Davis & Co. of Detroit, Michigan (1878), is due the credit of making the first pharmaceutical preparation (the fluid extract) and of bringing this preparation into general conspicuity, through their advertisements and business connections. It may be said without danger of controversy that this firm introduced and established Cascara Sagrada as a remedy.

To Dr. C. H. Adair (1878), of Colusa, California, is due the credit of furnishing the botanical specimens that established the drug's botanical position.

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Medicinal Plants of Brazil.[*]

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Popular Remedies from the Lauracæ.

Persea alba Nees. Kommt vor in den nördlichen Staaten, vorzugsweise in Goyaz und Alagoas, wo dieselbe *Lauro* — Lorbeer benannt wird. In Pernambuco heisst dieselbe *Lauro conga de porco* — Schweinjoch Lorbeer.

Ein ansehnlicher Baum mit dunkelbrauner, glatter Rinde. Die Blätter sind kurzgestiehlt, steif, lederartig, lancettlich, mattgrün, unterseits hellgelblich. Der Blüthenstand besteht aus kurzen Rispen. Die Frucht ist eine kleine, runde Beere.

Die Pflanze wird nicht arzneilich benutzt. Das weisse, etwas poroese Holz wird zu Brettern, aus welchen Marmeladen- und Confectkisten angefertigt werden, sowie auch zu verschiedenen Küchengeräthschaften verarbeitet. Die gegabelten Aeste dienen als Joch für Schweine, um dieselben zu hindern die Umhegung der Weide zu passiren.

Persea alba Nees. Occurs in the northern states, especially in Goyaz, and Alagoas, where it is called *Lauro* — Laurel. In Pernambuco it is known as *Lauro conga de porco*—swine's yoke laurel.

A considerable tree with dark brown, smooth bark. The leaves are short petioled, stiff, leathery, lanceolate, dull green, the under side bright yellowish. The inflorescence consists of short panicles. The fruit is a small, round berry.

This plant is not used medicinally. The white, somewhat porous wood is made into boards out of which containers for marmalade and confectionery are constructed. It is also worked up into various kitchen utensils. The forked branches are used as yokes for swine to prevent them from going through pasture fences.

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[*] New Preparations, Detroit, Parke, Davis & Co.

[†] Introductory to a contribution from chemical investigations of Rhamnus Purshiana, undertaken by Alfred R. L. Dohme.

[‡] New Preparations, January, 1878, p. 1.

[*] Continued from p. 51. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

Persea splendens var. chrysophylla Meissn. Bekannt als *Lauro amarello*—gelber Lorbeer — in den Staaten Goyaz, Bahia, Pernambuco und Parà.

Ein bis neun Meter hoher Baum. Blätter länglich, lancettlich. Blüthenstand eine astige Rispe. Beere rothbräunlich, von der Grösse einer grossen Olive. Das hellgelbe Holz ist ungemein dauerhaft und zum Schiffsbau wie auch Häuserbau besonders geschätzt, da es nicht von der Holz zerstörenden Termite beschädigt wird. Da es sich leicht poliren lässt werden elegante Möbel davon angefertigt. Sp. Gew. 0.521 bis 0.530.

Persea gratissima Gaertn. Diese Pflanze fehlt in keinem Garten der tropischen Staaten und soll in den Staaten Parà und Amazonas im Urwald vorkommen; doch ist die Benennung nicht einer der Sprachen der brazilianischen Eingebornen entnommen, sondern der Caraibensprache, nämlich dem Worte *abacate*. Der frühere Portugiese, und der ungebildete Arbeiter noch jetzt, braucht in seiner Aussprache das c statt v, z. B. cinho statt vinho etc. Auf diese Weise ist die hier gebräuchliche Benennung *abacate* für die Frucht entstanden und *abacateiro* für den Baum.

Der Baum gedeiht hier sehr leicht und liefert nach fünf Jahren schon Früchte. Er erreicht gewöhnlich eine Höhe von 12 Meter bei 62 Centim. Durchmesser. Die Früchte reifen im April und werden wie die Bananen geerntet wenn sie vollständig entwickelt aber noch hart sind. Auf Stroh gelegt werden sie dann in einigen Tagen zur Reife gebracht. Durch die langjährige Kultur haben sich mehrere Varietäten entwickelt. Hier im Staate Rio de Janeiro sind nur zwei derselben bekannt.

1.) **Abacate royo.** Violette Abacate. Dieselbe hat die Grösse der gewöhnlichen Abacatefrucht. Die Fruchtschale ist von braunrother und violettrother Farbe, das Fruchtfleisch dunkelgrün und wohlschmeckender als das der gewöhnlichen Abacate.

2.) **Abacate piqueno.** Wahrscheinlich aus der vorhergehenden entstanden und erreicht nur die Grösse einer Bergamottbirne. Die Fruchtschale ist hellviolett, das Fruchtfleisch dunkelgrün.

Diese ist die wohlschmeckendste und zarteste der drei Sorten. Die Beere des gewöhnlichen und häufigsten Abacatebaumes hat die Form und Grösse einer Tafelbirne. Die dünne, lederartige, hellgrüne Fruchtschale enthält ein mattgrünes Fruchtfleisch, welches in 2 bis 3 cm. dicker Lage den Walnussgrossen rothbräunlichen Samenkern umgiebt.

Die Früchte wiegen von 400 bis 600 Grm. und bestehen aus 5 p. c. Fruchtschale, 75 p. c. Fruchtfleisch und 20 p. c. Kern. Die frische Fruchtschale enthält 78.470 p. c. Wasser, 1.165 p. c. Chlorophyll und Fett, 1.300 p. c. hellbraunes Harz, 0.130 p. c. Eisen grünende Gerbsäure, Eiweiss, sowie Spuren von Zucker etc. Gekocht wird dieselbe dem Schweinefutter beigemischt. Die Samenkerne sind rund, rothbräunlich und spalten sich leicht in zwei Samenlappen. Auf der Spaltungsfläche sind sie glänzend dunkelroth. Dieselben wurden zuerst 1829 von Ricord-Madiana, dann von Pibram und 1866 von Dr. Wittstein untersucht. Derselbe fand in den Samen: Butterartiges Fett, 7 p. c.; braun-rothes Harz, 5.4 p. c.; Stärkemehl, 10 p. c.; Proteinsubstanzen, 11 p. c.; Bitterstoff; gelbes Harz; Eisen grünende Gerbsäure etc. Madiana fand auch Gallussäure, und Pibram erhielt durch Destillation ein stearoptenartiges ätherisches Oel von campherartigem Geruch und Geschmack. Meine Untersuchung der Samenkerne ergab: Wasser, 56.876;

Persea splendens var. chrysophylla Meissn. Known as *Lauro amarello*—yellow laurel — in the states Goyaz, Bahia, Pernambuco, and Parà.

A tree one to nine meters high; leaves oblong or lanceolate; inflorescence a branching panicle; berries reddish-brown, of the size of a large olive. The light yellow wood is unusually durable and especially valuable in the construction of ships and houses, since it is not harmed by the wood-destroying termites. Because it is easily polished, elegant furniture is made of it. Spec. grav. 0.521 to 0.530.

Persea gratissima Gaertn. This plant is lacking in no garden in the tropical states and is reported as present in the primeval forests of the states of Parà and Amazonas; still the name is not derived from the language of the Brazilian natives, but from the Caribbean language, from the word *abacate*. The earlier Portugese and the uneducated laborer even to-day in his speech uses c instead of v, e. g. *cinho* instead of *vinho*, etc. In this way the name here used for the fruit, *abacate*, originated, also *abacateiro* for the tree.

The tree flourishes readily here and in about five years bears fruit. It attains usually a height of twelve meters with a diameter of sixty-two centimeters. The fruits ripen in April and, like bananas, are gathered after they are completely developed, but still hard. They are laid on straw and ripen in a few days. By long cultivation, a number of varieties have developed. Here, in the state of Rio de Janeiro, but two are known.

1.) **Abacate royo.** Violet abacate. The size is that of the usual abacate fruit. The rind is of a brownish-red and violet color, the flesh of the fruit dark green and of more agreeable taste than the common abacate.

2.) **Abacate piqueno.** Probably originated from the above and attains only to the size of a bergamot pear. The rind is light violet, the flesh dark green. This is the most palatable and delicate of these kinds.

The berry of the common and most abundant abacate tree is in form and size like the table pear. The thin, leathery, light green rind encloses a pale green flesh, which surrounds, in a layer two to three centimeters thick, a reddish-brown seed of the size of a walnut.

The fruits weigh from 400 to 600 grams and consist of rind, 5 percent; flesh, 75 percent; seed, 20 percent. The fresh peel contains 78.470 percent water; 1.165 percent chlorophyll and fat; 1.300 percent light brown resin; 0.130 percent tannin colored green with iron salts; proteid, traces of sugar, etc. After being cooked, they are mixed with the feed for swine. The kernel of the seed is round, brownish-red, and the cotyledons are easily split apart. The split surfaces are shining dark red. The seeds were first investigated in 1829 by Ricord-Madiana, later by Pibram, and in 1866 by Dr. Wittstein. Wittstein found in the seeds the following: Butter-like fat, 7.0; brownish-red resin, 5.4; starch, 10.0; proteid substances, 11.0 percent. Bitter principle, yellow resin, tannin colored green with iron salts etc. Madiana found also gallic acid, and Pibram obtained by distillation a stearopten-like, ethereal oil with camphoraceous odor and taste. My investigation of the seed gave the following: water, 56.876; fatty oil, 0.129; starch, 8.534;

fettes Oel, 0.129; Stärkemehl, 8.534; Glycose, 1.080; Eisen grünende Gerbsäure, 1.572; Perseit, 3.820; Proteinstoffe, 1.300; rothes Harz, 2.328; Extract, 2.092; Asche, 1.010 Procent.

Eine grosse Portion der frischen, geruchlosen Kerne wurde destillirt, aber auch nicht eine Spur eines ätherischen Oeles erhalten; ebensowenig gelang es, Gallussäure nachzuweisen. Das Fruchtfleisch wurde ebenfalls zuerst von Ricord-Madiana untersucht. Derselbe fand: Fettsubstanzen, 9.9; stickstoffhaltige Materie, 5.6; Gummi, 5.6; Faser, 1.2 Procent. In dem Fruchtfleische der unreifen, noch nicht vollständig entwickelten Frucht fand er 10.058 Procent Stärkemehl, sowie Gerbsäure, welche beim Reifen verschwindet. Meine Untersuchung des frischen, reifen Fruchtfleisches ergab: Wasser, 80.670; gelbes, fettes Oel, 8.500; Glycose, 3.175; Stärkemehl, 1,877; Proteinstoffe, 1.635; Perseit, 0.783; Aepfelsäure, 0.049; Weinsteinsäure, 0.082; Extract etc., 2.775; Asche, 0.980 Procent. Dr. Busse, Assistent des Prof. Dr. Ludwig in Jena, fand in 100 Theilen Trockensubstanz 1.353 Theile Stickstoff. Dieselbe ist also reicher an Proteinsubstanz als Mandioccamehl (0.322 p. c.) und Mais (0.9 p. c.), und steht an Gehalt von Kohlehydraten wenig zurück. Die Frucht wird daher mit Recht wie Banana und Brodfrucht als Nahrungsmittel benutzt. Im Fruchtfleisch ist keine freie Säure vorhanden. Die organischen Säuren sind an Kalk und Kali gebunden. Deshalb besitzt die Frucht einen faden, süsslichen Geschmack. Der Volksinstinkt hat zum Genuss derselben, durch Zusatz von Citronensäure und Zucker, das Richtige getroffen, um dieselbe wohlschmeckend zu machen. Das fette Oel ist transparent, gelblich, geruchlos, von mildem Geschmack, dem Provenceröl sehr ähnlich.

glucose, 1,080; tannin colored green with iron salts, 1.572; perseite, 3,820; proteid substances, 1.300; red resin, 2.328; extractive, 2.092; ash, 1.010 percent.

A quantity of the fresh, odorless kernels was distilled but no trace of an ethereal oil was detected; the attempt to find gallic acid was likewise fruitless. The flesh of the fruit was also first investigated by Ricord-Madiana. He found as follows: fatty substances, 9.9; nitrogen-containing substances, 5.6; gum, 5.6; fibre, 1.2 percent. In the flesh of the unripe, incompletely developed fruit he found 10.058 percent starch as well as tannin which in ripening disappeared. My investigation of the fresh, ripe flesh of the fruit gave as follows: water, 80.670; yellow fatty oil, 8.500; glucose, 3.175; starch, 1,877; proteid, 1.635; perseite, 0.783; malic acid, 0.049; tartaric acid, 0.082; extractive etc., 2.775; ash, 0.980 percent. Dr. Busse, assistant to Prof. Dr. Ludwig at Jena, found in 100 parts of dry substance 1.353 parts of nitrogen. It is, therefore, richer in proteids than in manioc meal (0.322 percent) and maize (0.9 percent) and the carbohydrate content is but a little less. The fruit is, therefore, rightfully used, like the banana and the bread fruit, as an article of nutrition. The fruit-flesh contains no free acids. The organic acids are combined with calcium and potassium, therefore the fruit has an insipid, sweetish taste. To make the fruit more palatable, the popular instinct has found the right means in the addition of citric acid and sugar. The fatty oil is transparent, yellowish, odorless, of a mild taste, similar to that of Provence oil.

(To be continued.)

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Drouot's test for margarin in butter. The sample is melted: butter is transparent, margarin turbid. *Bischoff*, also *Jahr* have recently devised apparatus whereby the behavior of the molten fat when shaken with warm water can be observed. Margarin rapidly separates from the water, whereas the butter is completely emulsified. For details see Ph. Centrh., 37, p. 43.

Dudley's reagent for glucose. Bismuth subnitrate is dissolved in a little nitric acid, an equal volume of acetic acid is added to the solution and diluted with water to ten times its volume. The urine to be tested is made alkaline, a few drops of the reagent are added and the mixture boiled for from 20 to 30 seconds. In the presence of glucose the bismuth compound is reduced, a black precipitate being produced.

Comp. *Almén's*, *Boettger's* tests.

Duflos' aniline reaction. With dilute sulphuric acid and a trace of lead peroxide aniline produces a greenish color.

Dupasqier's reagent for organic substance in water is an aqueous solution of gold chloride. If water is boiled with this reagent the presence of organic matter is indicated by a blueish-violet color due to the reduction of the gold, or by the formation of a gold mirror.

Eboli's reaction for cantharidin. The solution to be tested is heated with sulphuric acid and potassium-bichromate is added. If cantharidin is present a handsome green color is produced.

Ehrlich's diazo-reaction is the test for pathologically changed urine by means of diazo-benzene sulphuric acid. *Pentzoldt* (q. v.) uses the reaction for the detection of glucose (upon the addition of potassa), *Ehrlich* and others for the diagnosis of various diseases (upon addition of ammonia), especially for the detection of bile coloring matter. The directions differ materially. The reagent is always freshly prepared, e. g. according to the following formula:

a.		*b.*	
Sulphanilic acid...	5	Sodium nitrite.......	0.5
Hydrochloric acid	50	Water....................	100
Dist. water..........	1000		

For use, 6 ccm. of solution *b* are added to 250 ccm. of solution *a*.

According to more recent statements a diazobenzene sulphuric acid 1:60 is employed as *Ehrlich's* reagent.

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* Continued from p. 205.

Urine is tested according to different methods:

I. Equal volumes of urine and the reagent are mixed and ⅛ volume of ammonia is added. In case of typhus, pneumonia, measles, the solution is colored red, the color being readily recognizable in the foam when the solution is shaken.

II. According to Charité, Annalen, 1886, for the detection of bile coloring matter, *Erlich's* reagent is added to urine diluted with an equal volume of dilute acetic acid. The resulting dark color is converted into violet upon the addition of an acid, particularly of glacial acetic acid.

III. The urine to be tested is shaken with chloroform. To the chloroformic solution 1 to 2 volumes of *Ehrlich's* reagent and sufficient alcohol to make the mixture homogeneous are added. If bilirubin is present a red color is produced, which upon careful addition of concentrated hydrochloric acid is converted into violet and blue. Upon the addition of potassa solution three zones are produced, a lower greenish-blue one, an upper pure blue zone and between a reddish band.

Erlich's gentian violet solution for staining bacteria is produced by shaking 4 ccm. aniline with 100 ccm. distilled water and separating the solution from the undissolved aniline by filtration through a moist filter. To the filtrate 11 ccm. of a concentrated alcoholic solution of gentian violet are added while shaking, and the mixture is allowed to stand for 24 hours.

Einbrodt's reagent for ammonium salts is a solution of mercuric chloride made slightly alkaline by the addition of potassium carbonate. With ammonium salts this solution produces a white turbidity or precipitate.

Einhorn's test for sugar in urine by means of the fermentation method. The formation of carbonic acid upon treating the urine with yeast is construed as a certain indication of the presence of glucose in the urine. *Einhorn* and others (v. *Arndt*) have constructed special fermentation saccharometers, which permit an exact quantitative estimation.

Erdmann's reagent for alkaloids. Six drops nitric acid 1.25 are mixed with 100 ccm. water and of this solution 10 drops are added to 20 ccm. pure concentrated sulphuric acid. According to another statement 10 drops of nitric acid 1.185 are diluted with 20 ccm. water and 20 drops of this solution are added to 40 ccm. pure concentrated sulphuric acid. To 1 to 2 mg. of the dry alkaloid, placed on a watch-glass over white paper or in a white porcelain dish, 1 ccm. of the reagent is added and the mixture is set aside for ¼ to ½ hour at a temperature of from 18 to 22° C. As to the resulting color reaction consult *Hager*, Pharm. Praxis I, 208.

Erlicki's solution, a hardening solution for microscopic preparations, contains 2.5 g. potassium bichromate and 0.5 g. copper sulphate in 100 ccm. water.

Errera's solution for the extraction of alkaloids is an alcoholic 5 p. c. tartaric acid solution.

Erbach's reagent for albumen is a solution of 10 g. picric acid and 20 g. citric acid in 1 l. water. In albuminous solutions (urine) the reagent produces (eventually upon the addition of acetic acid) a yellow precipitate. The amount of the latter, which can be estimated approximately in the albuminometer, can serve also for the quantitative estimation of albumen.

Erbach's ureometer. See *Huefner's* reagent.

Eykmann's phenol reaction. A very dilute phenol solution produces upon the addition of a few drops of spirit of nitrous ether in contact with concentrated sulphuric acid a red zone reaction.

Farrant's solution, a preservative for microscopic preparations, consists of 1 p. gum arabic, 1 p. glycerin and 1 p. concentrated aqueous solution of arsenious acid.

Faure's test for genuine wine coloring matter. If to 2 ccm. red wine 10 drops of a 2 p. c. tannin solution and 6 drops of a 2 p. c. gelatine solution are added, the coloring matter from wine is completely precipitated, whereas coal-tar dye-stuffs remain in solution.

Fehling's solution for the estimation of sugar and reagent for other reducing substances. For immediate use equal volumes of the following solutions are mixed.

I. 34.639 g. crystallized, not effloresced copper sulphate are dissolved in water and the solution diluted to 500 ccm.

II. 173 g. crystallized Rochelle salt and 50 g. caustic soda are dissolved in sufficient water to make 500 ccm.

To the reagent diluted with 5 p. of water the sugar solution of about 1 p. c. strength is gradually added. Discoloration takes place and red cuprous oxide is precipitated. 10 ccm. of *Fehling's* solution are reduced by 0.05 g. grape sugar, 0.067 g. milk sugar, 0.0475 g. cane sugar and 0.045 g. dextrin or starch, the last three having been previously inverted with dilute mineral acid. It should be understood that many other substances also reduce *Fehling's* solution.

According to an older formula *Fehling's* solution was prepared as a single solution and had to be prepared fresh every time since the mixed solutions do not keep well.

Solutions identical with or similar to *Fehling's* reagent are *Barreswil's*, *Frommherz's*, *Trommer's*, *Violette's* and *Worm-Mueller's* solutions (q. v.).

Fiebig's sugar estimation by means of the fermentation glucoseometer. See *Einhorn*.

Finkelnburg's reagent for excrements in the examination of soil and water is an alkaline solution of silver oxide in sodium thiosulphate. If substances containing excrements are boiled with hydrochloric acid for several minutes, then made alkaline with soda and again heated to the boiling-point with the reagent, a dark reddish-brown precipitate is found, whereas the solution remains light brown in color.

Finkener's test for impurities in castor oil. 10 ccm. of oil are shaken with 50 ccm. alcohol, sp. gr. 0.829 at 17.5°. If a turbidity is produced which does not disappear when the mixture is heated to 20° at least 10 p. c. of foreign oils have been added.

Filsinger's test for cacao oil (modified ether test). Two g. of oil are shaken in a graduated tube with 6 ccm. of a mixture of 4 p. ether 0.725 and 1 p. alcohol 0.810 and set aside. Pure oil yields a clear solution which does not become turbid at 0°.

Fischer's reagent is phenylhydrazine. With aldehydes, ketones, carbohydrates it yields condensation products which are difficultly soluble. In order to test for sugar in urine, 50 ccm. of the latter are heated with 2 g. phenylhydrazin hydrochlorate and 4 g. sodium acetate for ½ to 1 hour on the waterbath. If sugar is present, phenylglycosazone is precipitated. This is dissolved in alcohol, water is added and the alcohol is evaporated. The resulting needles of the glycosazone melt at 204 to 205°.

Fleischl's test for bile coloring matter. See *Gmelin's* test.

Fleitmann's arsenic test. See *Marsh's* arsenic test.

Flueckiger's arsenic test. In place of the silver nitrate used according to *Gutzeit* (q. v.) solution of corrosive sublimate is employed. With it arsenuretted hydrogen produces a yellow spot, which is darkened by water but is permanent toward alcohol. Very dilute antimony hydride does not affect the corrosive sublimate. Somewhat less diluted it produces a brown spot which disappears upon the addition of alcohol if sufficient sublimate was on the test-paper.

Flueckiger's reaction for quinine. If to a solution of quinine bromine water and an excess of ammonia are added, an emerald-green color is produced (Thalleiochin reaction). Compare *Brand's* reaction.

Flueckiger's test to distinguish between naphtholes. If 0.2 g. naphthol are shaken with 0.2 g. mercuric chloride, 0.1 g. nitric acid and 10 ccm. water at 100°, α-naphthol is indicated by a slight scarlet-red precipitate, whereas β-naphthol yields a voluminous reddish-brown precipitate.

Flueckiger-Behren's test for sesame oil. Five drops of sesame oil when treated with 5 drops of a cold mixture of equal parts of concentrated sulphuric acid, nitric acid and water, produce a green zone. If 5 drops of carbon disulphide are immediately added an upper greenish layer is produced, which becomes discolored more slowly than the original color.

Focke's test for grape sugar. See *Trommer's* reaction.

Fokker's reaction for the detection of uric acid. If to urine containing uric acid, previously made alkaline with soda, solution of ammonium chloride is added, the difficultly soluble urate of ammonium is formed. This test is also used, especially according to *Salkowsky's* modification, for the quantitative estimation.

Formanek's reaction for alkaloids. Various alkaloids, after the evaporation of their solutions in nitric acid (see *Vitali*), yield characteristic color reactions when treated with ammonia and the alkalies. For details consult Ph. C. 36, p. 600.

Fraude's reagent for alkaloids is an aqueous solution of perchloric acid, sp. gr. 1.13 to 1.14. Upon boiling a trace of the alkaloid with several cubic centimeters of the reagent, aspidospermine is colored bright red, brucine madeira red, strychnine reddish-yellow.

Fresenius' phenol reaction. If phenol is boiled with a solution of mercurous nitrate containing traces of free acid, metallic mercury is precipitated and the odor of salicylic aldehyde is produced. Comp. *Plugge's* phenol reaction.

Fresenius' detection of nitrous acid by distillation. The water to be examined is acidulated with acetic acid and distilled. The distillate is collected in potassium iodide starch solution acidulated with sulphuric acid, whereby nitrous acid is indicated by the formation of a blue color.

Frey's fuchsine solution for staining microscopic preparations is a solution of 0.01 g. crystallized fuchsine, 20 to 25 drops absolute alcohol and 15 ccm. water.

Fritsche's reagent is dinitroanthraquinone. With many hydrocarbons it yields crystalline compounds.

Froehde's reagent for alkaloids is a freshly prepared solution of 0.01 g. sodium molybdate in 1 ccm. concentrated sulphuric acid (according to others 0.01 g. : 10 ccm., also 1 g. : 10 ccm.). With alkaloids and glucosides it produces characteristic color-reactions. For details consult *Hager*, Pharm. Praxis I, 208. Proteïnes produce a dark blue color.

Froehde's hydrocyanic acid reaction. If a cyanide is fused with sodium thiosulphate, the fuse dissolved in water and some ferric chloride added a blood-red color results.

Frommherz's solution for the detection of glucose consists of 41.76 g. crystallized copper sulphate, 20.88 g. potassium bitartrate and 10.44 g. potassa dissolved in water sufficient to make a liter. See *Fehling's* solution.

Fuerbringer's reagent for albumen is a mixture of mercuric and sodium chloride with citric acid and sodium chloride. In albuminous urine the reagent produces a turbidity or a flocculent precipitate. Inasmuch as uric acid is likewise precipitated the urine must first be diluted. See *Stuetz's* albumen capsules.

Gabbet's dye for tuberculose bacilli consists of 2 g. methylene blue, 25 g. concentrated sulphuric acid and 75 g. water.

Gaglio's test for mercury vapors in the atmosphere. The air to be tested is passed through a solution of palladium chloride in 500 p. water. (The palladium chloride is previously dissolved in hydrochloric acid with the aid of nitric acid and repeatedly evaporated to dryness with hydrochloric acid.) If mercury is present the solution is reduced as shown by the formation of black spots.

Gallois' test for inosite in urine. After the glucose is removed by fermentation and the albumen by boiling the urine is evaporated to a small bulk and a few drops of mercurous nitrate solution are added. If inosite is present the residue upon complete evaporation is yellow. (Albumen colors the residue rose-red, sugar colors it black; hence these must be removed completely.)

Ganther's blood-reaction. Minute traces of blood eliberate oxygen from hydrogen peroxide producing foam. Other animal substances produce the same phenomenon.

Gardiner's reagent for tannic acid is a solution of ammonium molybdate, which produces a yellow precipitate with the acid.

Gassend's modification of *Baudouin's* reaction (q. v.) for sesame oil consists in the addition of sodium bisulphite, which removes the color occasionally produced with genuine olive oil, but does not affect that produced by sesame oil. To 15 ccm. oil and 10 ccm. of sugar solution in hydrochloric acid 2 to 3 ccm. of a 10 p. c. bisulphite solution are added, the mixture shaken and set aside for 5 minutes. If the red color remains the oil is supposed to be adulterated with sesame oil.

Gautier's precipitation of tannin is effected by shaking with cuprous carbonate and the addition of alcohol, or by the addition of aqueous copper acetate 1:30.

Gautier's reagent consists of 250 ccm. soda-solution, 50 ccm. 3 p. c. copper sulphate solution and 700 ccm. glacial acetic acid. This mixture precipitates serum-albumen from its solutions, but not egg-albumen.

Geissler's test-paper for albumen consists of strips of filter-paper, half of which are saturated with concentrated citric acid solution, half with 3 p. c. sublimate solution to which 12 to 15 p. c. potassium iodide have been added. First a strip of the acid paper is dipped into the urine to be tested, then the mercury-potassium iodide paper. If albumen is present a precipitate results. Concentrated urine must first be diluted. See *Oliver*.

Geitel's test for neutral fat in free fatty acids. Two gr. of the fatty acids are dissolved in 15 ccm. hot alcohol and 15 ccm. ammonia are added. If a considerable percentage of neutral fat is present the solution becomes turbid. Traces of neutral fat are detected by adding carefully a layer of cold methyl alcohol. If neutral fat is present a turbidity is produced at the zone of contact.

Geogehan's acid reaction. All inorganic as well as organic acids with the exception of hydrocyanic acid precipitate red mercuric iodide from the solution of the double salt of mercuric cyanide and potassium iodide.

Gerard's test for coloring matter from the bile. Solution of iodine in aqueous potassium iodide is added in small quantity to the chloroformic extract of the urine to be tested. If potassa solution is added the reddish color of the chloroformic extract disappears and in the presence of bile coloring matter the potassa solution is colored green.

Gerrard's test for atropine and hyoscyanine is a solution of 5 g. mercuric chloride in 95 g. 50 p. c. alcohol. If 2 ccm. are heated with 0.001 g. atropine a red precipitate is formed. Hyoscyamine produces a similar precipitate. Homatropine is not precipitated.

Giessel's reaction for cocaïne. 5 ccm. of a 1 p. c. solution of cocaïne yield upon the addition of 2 ccm. saturated potassium permanganate solution a violet precipitate of cocaïne permanganate.

Girard's reaction for coaltar dyestuffs in wine. To 20 ccm. of the wine to be tested 4 ccm. of 10 p. c. potassa solution and 20 ccm. of a 5 p. c. mercurous sulphate solution are added, the mixture shaken and filtered. Natural wine yields a colorless, artificially colored wine a red filtrate.

Glaessner's reaction for the distinction between fatty oils depends upon the behavior of these oils toward fuming nitric acid, concentrated sulphuric acid and carbon disulphide. For details consult *Benedikt*, Analyse der Fette, 2, p. 309.

Gmelin's salt is potassium ferricyanide.

Gmelin's reaction for biliary coloring matter. A layer of the urine to be tested is carefully poured over fuming nitric acid. In the presence of biliary coloring matter zone color-reactions are produced changing from green to blue, violet, red and yellow. In order to concentrate the intensity of the reaction a precipitate of barium sulphate is produced in the urine which carries with it the coloring matter. The collected and dried precipitate is then tested with nitric acid.

Modifications after:

Bruecke. Dilute, boiled nitric acid is first added, then concentrated sulphuric acid.

Vitali. A few drops of potassium nitrite solution are added, then dilute sulphuric acid.

Masset. Concentrated sulphuric acid is first added to the urine, then a crystal of potassium nitrate; green streaks emanate from the fragments of the nitrite.

Fleischl. The urine is mixed with an equal volume of a concentrated solution of sodium nitrite, then a layer of concentrated sulphuric acid is added from below by means of a pipette.

Rosenbach. Nitric acid containing nitrous acid is added to the filtered urine.

Dragendorff, *Deubner*, filter through porous plate in place of ordinary filter-paper and then make the nitric acid test on the plate.

Hilger. The urine is treated with barium hydrate at a moderate temperature and the resulting precipitate, after being washed, is tested with nitric acid.

Godeffroy's reagent for alkaloids is a solution of antimony chloride. From aqueous hydrochloric acid solutions it precipitates aconitine, atropine, quinine, cinchonine, piperine, strychnine, veratrine in form of white or yellow precipitates. Caffeine and morphine are not precipitated.

Godeffroy and **Laubenheimer's** reagent for alkaloids is silico-tungstic acid, which produces sparingly soluble precipitates with the hydrochloric acid solutions of the alkaloids.

Gouver's solution for the detection of albumen is a solution of mercuric cyanide in an excess of potassium iodide. With albuminoids this solution produces a white precipitate.

Godbay's (also *Goadby's*) solution serves for the preservation of microscopic sections and consists of 120 g. sodium chloride, 60 g. alum, 0.25 sublimate and 2.33 liters of water.

Grahe's test for genuine cinchona barks. Genuine cinchona barks when heated in a test tube yield red fumes, whereas spurious barks produce vapors and tar of a brownish color.

Gram's dye for bacteria is prepared by shaking 15 drops of aniline with 15 g. water, filtering the solution and adding to the filtrate 4 to 5 drops of saturated alcoholic solution of gentian violet.

After the preparations are stained with the above dye they are brought into a solution of iodine in potassium iodide (1 g. iodine, 2 g. potassium iodide, 300 ccm. water) and then into alcohol. Certain bacteria (anthrax) retain the color, whereas others (cholera, typhus, Bact. Coli) are discolored.

Grandeau's reaction for alkaloids. To the solution of the alkaloids in concentrated sulphuric acid bromine water is carefully added. With some alkaloids it produces characteristic color reactions. Thus e. g. the solution of digitaline and digitaleïne in sulphuric acid is yellow, but becomes rose-red to violet through the action of bromine. Preparations of digitalis produce the same reaction. Morphine also produces a red color.

In place of bromine water *Dragendorff* employs a solution of bromine in potassium hydroxide or bromine vapors.

Greittherr's cocaïne reaction. If to a few drops of a cocaïne solution mixed with 2 to 3 ccm. chlorine water a few drops of 5 p. c. palladium chloride solution are added, a handsome red precipitate is produced, which is insoluble in alcohol and ether, but soluble in sodium hyposulphite solution.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

East Indian Drugs.

Of interest to pharmacists are notes and descriptions drawn from a collection of East Indian drugs by Prof. Dr. Hartwich of Zurich, exhibited by Gehe & Co. in connection with the twenty-fifth German Apothecaries' Day at Dresden. These notes are here translated from the last number (September, 1896) of Gehe & Co's. Handelsbericht.

Acacia Arabica Willd. (**Mimosaceæ**). This tree is found in Africa, Arabia and India. Its bark, at present under examination, has had long recognition as valuable tanning material. Its tannin content is calculated at from 22 to 31 percent and is therefore very important. Like many other drugs containing tannin it is also used as an astringent tonic.

Anona squamosa L. (**Anonaceæ**). A native of the West Indies but cultivated every where in the tropics on acount of its palatable fruit, (Sweet-Sop, Sugar-Apple, *Pomme de Canelle, Caneel-Appel, Anon*). Besides the seeds, which we have before us, the leaves and bark are also used medicinally, the former as a sudorific, the latter as a drastic purgative. The seeds themselves certainly contain powerful principles; beside the oil in them, a resin has been found which either is itself the active principle or contains it. The infrequent notices so far made of it, set it down plainly as in part poisonous. At any rate it should be used with caution. Small particles getting into the eye produce pain and violent inflammation. The natives of India apply it as a remedy for head-lice.

The seeds of other species of *Anona* seem also to act similarly; as those of *A. muricata* L., *A. palustris* L., *A. spinescens* Mart., which are used to poison fish and to exterminate destructive insects. The seeds of *Anona squamosa* L. are from one to five cm. long; they grow to a length of eight mm. and to a thickness of five mm.; they are of a grayish-brown color, smooth, blunt at one end at which the small embryo lies in the cleft albumen. In the albumen are found numerous secretory cells; these are especially abundant at the circumference. According to Dymock (Pharmacographia Indica I, p. 44) the albumen contains abundant starch. In the seeds before us, that is not the case, nor is it so with those of the *Anona muricata* which we have examined for the sake of comparison. The endosperm contains fat and aleurone grains as reserve material. Either Dymock examined unripe seeds or he was deceived by the peculiar reaction of the cell walls. These become, with iodine alone, of a marked blue color and might therefore consist of amyloid or a nearly related modification of cellulose. The reaction is so strong that cross-sections treated with iodine and examined without the microscope might easily show a misleading resemblance to the starch reaction.

Andrographis paniculata Nees. (**Acanthacæ**). This annual is a native of India, Ceylon and Java. It is also cultivated and has been introduced in the West Indies and upon Mauritius. The whole plant and its watery extract are of an exceedingly bitter taste on which account it is often used in the same manner as gentian, quassia, etc. A careful examination of this undoubtedly valuable drug has yet to be made. Flückiger and Hanbury have only shown the absence of an alkaloid and the presence of a small quantity of tannin.

In case this drug should find consideration among us it should be remarked that many of the Indian names applied to it, as: *Kirya, Nila vembu, Nila veppa*, are also used for another plant, (the *Swertia Chirata Ham.* of the *Gentianaceæ* which furnishes the *Herba Chiratae*) which has likewise a bitter taste.

In order to be able also to identify *Andrographis* in a dwarfed condition, it would also be important to notice the crystallites of calcium carbonate appearing in the tissues and especially characteristic of many *Acanthaceæ*. In the leaves these are of a long cylindrical form. In the stem bark the same forms also appear being more of a roundish-oval.

Azadirachta Indica Juss., syn: *Melia Indica Brandis* (**Meliaceæ**). This stately tree, growing to fifteen meters high, is found wild and cultivated in India, Ceylon and the Malay Archipelago. Of its numerous Indian appellations the names *Nimb, Vembu, Veppam* and *Limbode* are given: from these most of the others are derived. Its English name is Indian Lilac. In India almost all parts of the tree are used for medicinal purposes, bark, roots, blossoms, leaves, fruit, a gum and an oil produced from the seeds. The bark of the trunk and boughs seems to be especially called in use (*Cortex Margosae*) as a tonic and antiperiodic. The root-bark, the leaves and the fruit are used as antihelminthic, the leaves also as a remedy in stone-in-the-bladder and syphilis. As to the ingredients to which its medicinal efficacy might perhaps be ascribed, we know very little. In 1856 Cornish found in the bark an alkaloid whose presence must, according to later accounts, be questioned. Broughton (1873) states that the acrid element of the bark is a resin.

The leaves of the plant and the root-bark lie before us. The leaf is pennate with terminal leaflet and with from nine to fifteen pairs of leaflets. The single leaflet is long-acuminate, dentate-sinuate. The taste is very disagreeable, nauseating, not bitter however nor slimy. The investigation of its structure has not brought to light any especially characteristic elements or cellular arrangements.

In the palisade cells of the upper surfaces, small oxalate concretions are found, around the vascular bundles, single crystals. The cells of the spongy parenchyma are on the under side rather closely set together and somewhat elongated, so that here a palisade tissue is formed, although little apparent. The vascular bundles show on each side a layer of fibres. The epidermis-cells of the upper side are often in considerable groups divided by transverse walls so that in areas a hypodermis is formed. Whether these cells contain mucilage could not be determined, since in order to render the tissues distinct very strong reagents must be used. In this connection it may be observed that the leaves occasionally occur among the Tinnevelly senna leaves. The root-bark consists of very fibrous pieces externally reddish-brown with yellowish-brown corky areas, internally whitish, obliquely striate. The whitish cross-section under the lens shows no brown spots. The bark tastes very bitter, gives with water a whitish extract which, it is worth while to note, contains no tannin. The inner bark has medullary rays two or three cell rows in width; the bast rays are plainly composed of alternating groups of fibres and interposed soft bast. The latter can be recognized by a narrow zone of grouped sieve-tubes in the middle of each layer.

Balanites Roxberghii Planch. The fruit finds in India manifold uses. When unripe it is regarded as an antihelminthic and purgative. The dose is about the half of the pulp of one fruit; in smaller doses it favors the excretions. As antihelminthic it is also much used for cattle. It contains a principle closely related to saponin to which its action is probably due. The ripe seeds contain about 50 percent of a fatty oil (Zachun oil) which is tasteless, of a yellowish color and bleaches easily in the sun. Spec. grav. 0.9185. It belongs to the slowly drying oils and in many directions resembles the arachis-oil, (peanut oil.) It is used for burning and in medicine externally on wounds.

Berberis aristata D. C. (**Berberidaceae**). English: Nepaul Barberry, French: *Vinettier aristé.* Our drug consists of rather small pieces of the bark, to 2 cm. wide and perhaps 1 to 1½ mm. thick, of marked yellow or, on the inner side, more of a blackish color. On the outer side, the pieces bear a rather soft cork while on the inner side, rather hard, sharply keel-shaped ridges run lengthwise. In cross section immediately under the cork, here consisting of thin-walled cells, there can be distinguished in the middle bark, crowded groups of stone-cells, then single groups of thick-walled, slender fibres and, toward the inside, lastly, a connected layer of stone-cells which also forms the keel-like projections. This striking structure becomes clear on comparison with pieces of the stem of the near relative, *Berberis Lycium.* The wood contains wide medullary rays which pass across into the bark. Into these rays, a sclerenchymatous ring lying in the bark sends keel-like projections which often reach into the wood and thereby split the medullary rays. The halves of the medullary rays thus formed run along on both sides of the keel. Thus in the cross section, from the sclerenchymatous ring and its projections, half circles are formed by the cambium and the adjacent wood. In these half circles lie the phloem bundles and a half of each of the two neighboring medullary rays. Both are thin-walled and in the dry drug so shrunken that externally to the cambium, a series of cavities is formed which lends to the drug a very characteristic appearance. In our specimen, the thin-walled phloem and the tissue of the medullary rays is lacking, having been rubbed away.

The drug contains 2.205 percent berberine. The other related alkaloids, oxycanthine and berbamine, occurring in the East Indian *Berberis* species, could not be with certainty identified, the quantity of the drug at our disposal being too limited.

From this species, as well as from *B. Lycium* Royle and *B. Asiatica* Roxb., there is prepared in India a bitter, astringent tasting extract of the consistence of opium known as *Rusot* or *Rasot.* This extract is said to be the *Lycium* of the ancients. Since this is so often adulterated in India, the bark is used in preference to it. The bark is used, apparently with success, as a febrifuge also for diarrhoea and dyspepsia. The barks find technical use for dyeing.

Butea frondosa Roxb. (**Leguminosae**). Of this plant we have the long known Bengal kino and the seeds. The seeds are found singly in the point of the leathery pod. This pod is flat at the bottom, wing-shaped, and indehiscent. The seeds are flat, reddish-brown, becoming 4½ cm. long, 3 cm. wide, kidney-shaped, or ovate, somewhat wrinkled. The raphe runs from the hilum, located on the concave side, half way around the seed and disperses in branches in the leathery seed coating. The seeds are reputed in India to be a good antihelminthic. The decoction of two or three seeds is regarded as a sufficient dose. They are also used in herpes, and with astringents and rock salt for cloudiness of the cornea. They contain 18.2 percent fat.

Cantharides, Indian. The beetles received by us are of a somewhat cylindrical form, black, with exception of the wing covers which are yellowish-brown with black transverse bands. They belong to the genus *Mylabris* which contains a whole series of vesicle-forming species. It is not improbable that the kind before us is of real value for the preparation of cantharidin, since many species of the genus contain much more cantharidin than our *Lytta vesicatoria.* Since it is, however, well known that by careless storage the cantharidin-content is much decreased, which is probably the case with the specimen at hand since most of the beetles lack abdomen and head, consisting, therefore, mainly of thoracic segments and the wings, a determination of the cantharidin was out of the question.

Cassia Abusus L. The seeds of this plant, extending as far west as Central Africa, have been used since ancient times especially in the treatment of eye troubles, in a manner similar to that in which the well known jequirity seeds or paternoster peas from *Abrus precatorius* are used. They are used alone as a fine powder, or with alum, sugar, lemon juice or lard or in an infusion. They are said to be especially effective in the Egyptian eye trouble. According to B. Schuchardt, their action is manifested most plainly in the limiting and removing of redness, looseness (Auflockerung) and granulation of the conjunctiva in blenorrhoea. The seeds are called *Cheshmat, Chashmizok, Schischen,* etc.

Celastrus paniculata Willd. (**Celastraceae**). This plant occurs in the East Indies extending eastward over the Sunda Islands as far as the Philippines. It is called in India: *Malkanguni, Gundumeda, Valuluvai* and *Ati-panch-cham.* The seeds are said to be a stimulating remedy. They are used as an aphrodisiac, also in rheum, gout, apoplexy, leprosy, etc. Often, instead of the whole seed, the fatty oil prepared from them, present to about 30 percent, is used. It is of a red color, due to the arillus enclosing the seed, and has a bitter taste. Mixed with benzoin, cloves, nutmegs and mace, an empyreumatic oil is obtained by dry distillation which is used in beri-beri.

Colchicum. Unfortunately, it is impossible to determine accurately the peeled corms before us. Corms of many species, in part growing in India, in part imported from without, from Afghanistan also from Western Asia are used medicinally in India. *Colchicum luteum* Baker, from Himalayas to Beluchistan, *C. speciosum* Stev., from Afghanistan, perhaps also *C. variegatum* L. from Western Asia may here be kept in mind. In the Indian bazaars, they go by the name of

Sarinjan. It is to be remembered that formerly in occidentalmedicine they played a rôle as *hermodactyli.*

Crinum Asiaticum var. **toxicarium** Herbert. (**Liliaceae**). This handsome plant with beautiful flowers is found wild in India and the Molukkas, and is cultivated as a favorite in Indian gardens. The bulbs principally find use, as in the specimen at hand, cut into narrow strips. They are used as emetic and diaphoretic. They are noted by Flückiger and Hanbury as a substitute for *Scilla.*

Datura alba Nees. (**Solanaceae**). This plant occurs in India and, on account of the beautiful flowers, is much cultivated, e. g. in Southern Europe. The leaves, roots and seeds are before us. With the much broken leaves are mixed a few unripe, roundish, spiny fruits and flowers 16 cm. long. The leaves contain calcium oxalate in glands, in the roots it is present as "Krystallsand," which is likewise the case with our *Datura Stramonium.* The seeds are larger than in our native species, yellowish-brown, flat, somewhat auriculate in form. The cross section usually shows, running near the edge, a pair of pronounced projections in which, as at the edge, the cells of the epidermis of the seed-covering are bulged outward. The seeds and leaves especially are used as medicine; their properties are narcotic, sedative and even hypnotic. They are said to be used in India to make people unconscious for criminal purposes.

In China, from this plant a poison, *Wan to lo hua* or *Nao yang hua,* is prepared, concerning which more is not known. We will not neglect to note that according to Hanbury (Science Papers, p. 258, 266) *Naou yang hua* is the name for a flower which, with aconite tubers, is made into a powder which, before operations, is used externally as a pain-reducing remedy. He expresses the conjecture that it is the flower of a *Rhododendron,* but notes that according to Horaninow the name is used in China for *Hyoscyamus.*

Since information concerning the constituents of the plant are completely lacking, it seemed advisable to carry out at least a preliminary investigation with the material at hand. Dr. Peinemann determined the alkaloid-content according to Keller's method as follows: Seeds, 0.541 percent; root, 0.315 percent; leaves, 0.41 percent. All are calculated with reference to atropine. By comparison with the extraordinarily varying data found in the literature concerning *Datura Stramonium,* it appears that *Datura alba* is richer in alkaloids than our native species. The alkaloid was obtained as a colorless varnish. Treated in the known manner with fuming nitric acid and alcoholic potassium hydroxide, it gave the violet color of atropine, likewise, according to Flückiger, with sodium nitrate and potassium hydroxide, with concentrated sulphuric acid, the characteristic odor was detected so that the identity of the alkaloid obtained with the so-called solanaceous alkaloids is not to be doubted. On the other hand, sulphuric acid in the cold gave a color reaction which atropine etc. do not show, in that the alkaloid at the first moment dissolved with a red color which soon passed over into orange and yellow. Perhaps the coloration belongs to the indifferent stramonine, discovered by Trommsdorff.

Garcinia purpurea Roxb. (**Guttiferæ**). This plant is indigenous to India and Indo-China. The sour-tasting outer covering of the fruit is especially used as a remedy for scurvy and the oil of the seeds, the *Kokum* or Goa-Butter (Indian, *Kokam cha tel Bhirandel* etc.) is also used. The seeds are from one to two cm. long, about one cm. broad, brown, kidney-shaped. The embryo contains in its cells besides crystalline fat characteristic aleurone grains and, in certain cells, tannin. (Compare Ueber den Bau des Samens: Chemiker-Zeitung [Cöthen] 1892 p. 1031.) The seeds contain about thirty percent of fat, of which, with the imperfect apparatus only about ten percent is obtained. It is quite hard, almost powdery, white or yellowish; later it takes on a brownish tinge. It has a faint odor; its taste is mildly oily becoming after a time rancid. It melts at from forty to forty-one degrees and contains glyceride of stearic acid, myristic acid, oleic acid and also free fatty acids. It furnishes a hard soda-soap. It is said to be used for the adulteration of melted butter. It is probable that the fat does not possess any especial medicinal qualities. It is used like cocoa fat and also as a substitute for cetaceum.

Helicteres Isora L. (**Sterculiaceæ**). This plant is found in East India and the Malay Archipelago both as tree and shrub and spreads even to North Australia. The mucilage-containing root is used like Althaea; its bark is valued in India as a remedy for diabetes. The follicular capsules, twisted spirally around one another, as they have come to us, are used for cramps in children. They appear now to have reached Europe in considerable quantities, (Compare Handelsbericht for April 1892, p. 3).

Kowli seeds. **Croton oblongifolium** Roxb., the seeds of which are used as a purgative and which therefore, according to Flückiger and Hanbury (Pharmacographia) occur as a substitute for the croton seeds of *Croton Tiglium* L., bears in India the name *Kuli.* However it is out of the question that the seeds before us come from this species the seeds of which are small. On the other hand, according to the description in Podromus these seeds easily correspond to those of *Croton oblongifolium* Tharactes (*C. persimilis* Müll. Arg.), and it is not impossible that a confusion of the two species, has been made. This might easily occur by reason of the present popular disregard in pharmaceutical and pharmacological books of the authors' names and the plant names.

The seeds reach a length of two and one tenth cm., a breadth of one and two tenths cm., a thickness of eight tenths cm., ovate, having pointed ends with a marked caruncle. The outer side shows the grayish brown crusty seed-coat with irregular rough longitudinal stripes; the cross-section shows a large endosperm, in the middle the embryo of considerable size with flat cotyledons.

Beside the fatty oil and protoplasm, the cells of the endosperm show longitudinally very large aleurone grains which contain a considerable number of small globoids and badly formed crystalloids.

(To be continued.)

Pharmaceutical Technique.

A New Rubber Stopper.

A rubber stopper with cap of the same material has been introduced by **Richard Stiehler** of Coeln a. d. Elbe and was recently exhibited at Dresden. Fig. a. shows the erect cap, fig. b. the same when drawn over the neck of the bottle. The stoppers are made of various sizes like ordinary rubber stoppers. It is recommended in all cases in which the ordinary stopper can be used and has the additional advantage of the caps, which are apparent from the accompanying cuts.

[Pharm. Centrh. 37, p. 613.]

a. b.

Sterilization Apparatus.

Max Kaehler and **Martini** of Berlin have devised an apparatus for the sterilization of catgut and other substances which are to be sterilized in alcohol or another volatile liquid. The apparatus is comparatively simple and can be extemporized in any well equipped pharmaceutical laboratory. The substance to be sterilized is introduced into b (Fig. 1), the bottle placed on a wire netting in a water-bath and stoppered with a perforated rubber stopper, into the perforation of which the glass condenser d, e is inserted. In order to render the condenser less fragile it is made of two pieces. The thistle funneled top is covered with a watch-glass. The object of the perforated glass plate c is to prevent the rising water-vapors from heating the condenser. If organic preparations are to be sterilized in glass cylinders for exhibits, the cylinder is substituted for the bottle. In order to hold the cylinder firmly in position the water-bath is mounted by an inverted copper cone B (fig. 2). The details of the apparatus as well as the function of the various parts become apparent from the accompanying cuts.

[Pharm. Ztg. 41, p. 614.]

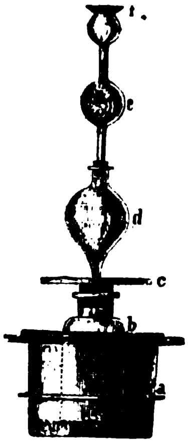


Fig. 1.

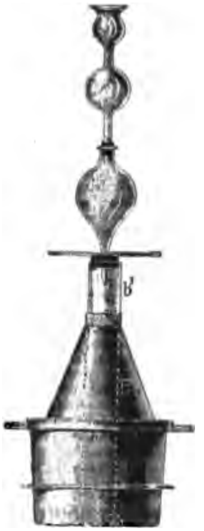


Fig. 2.

Chemistry.

Potassium Iodate-Starch Test-paper.

This is prepared by making a starch-paste from 2 g. of wheat starch and 100 ccm. water, adding 0.2 g. KIO$_3$, and saturating paper with the mixture. The dried paper is cut into strips which are used like similar test-papers. Traces of free SO$_2$ color the paper blue. To test for combined sulphurous acid the test-paper is first moistened with diluted hydrochloric acid (1:100). [Chem. Centr. B., 47^{II}, p. 513.]

A Bacillus as Pectin Ferment.

Winogradsky has communicated to the Paris Academy of Sciences the results of **M. V. Firbes'** researches in his laboratory at St. Petersburg upon the maceration of flax for the isolation of the fibres. The rotting is due to an obligate anaerobic bacillus, which acts not as a cellulose ferment, but as a pectin ferment. It dissolves the middle lamellæ of the cortical parenchyma, which consists of calcium pectinate and thus isolates the fibres.

[Botanical Gazette, 22, p. 182; from Compt. rend. 121, p. 742.]

Raphanol.

By distilling slowly the product of the maceration of roots of *Raphanus niger* in cold water, **H. Moreigne** has obtained a new volatile crystalline body which he calls raphanol. It is carried over along with essential oil from which it is separated by recrystallization from ether. The pure substance forms white, odorless, pearly microscopic crystals melting at 62°, insoluble in water, readily dissolved in ether and chloroform, also in the essential oil of raphanus, insoluble in alkali and in weak acids. When burnt, it was found to have the molecular formula C$_{29}$H$_{58}$O$_4$, which was confirmed by the cryoscopic method of Raoul. The general behavior of the body, determined as far as the small amount of material would permit, indicated that it is probably a lactone. The same body has been found by the author in other crucifers such as the red radish, turnip, long radish, water-cress and scurvy grass.

[Pharm. Journ. 56, p. 10; from Journ. d. Pharm. 57, p. 61.]

The Quantitative Estimation of Alkaloids.

On p. 21 mention is made of an earlier article on this subject by **C. Kippenberger**, which appeared in reprint form. The same author more recently contributed two lengthy articles on the same subject:—

1. Eine neue, für die analytische Praxis geeignete Methode der quantitativen Isolirung von Alkaloiden. The method is based on the ready solubility of the hydriodides of the alkaloidal superiodides in acetone, and conversion of the acetone solution into an aqueous solution of a salt of a mineral acid with the alkaloid.

2. Die Benutzung von Jodlösungen zum Zweck der titrimetrischen Werthbestimmungen von Alkaloidlösungen. This paper also is too lengthy to be abstracted and contains in form of a postscriptum a discussion of Gomberg's work, which together with other work along that line was summarized by Prof. Prescott on pp. 123, 148 and 172 of this journal. Those especially interested in this work will have to consult the original.

[Zeitsch. f. anal. Chem., 1896, pp. 407 and 422.]

Occurence of Quercetin in the Outer Skins of the Bulb of the Onion (Allium cepa).

It has long been a custom to use the outer dry skin of the bulb of the onion for dyeing Easter eggs; for this purpose the eggs are wrapped in the skins, the latter being kept in position by tying with thread or otherwise, after which the eggs are boiled in the usual manner. By this means a marbled or mottled pattern is obtained in various shades of brown, orange and yellow.

The effect thus produced seemed to indicate that onion skins probably contain a yellow adjective coloring matter towards which, in the custom alluded to, the lime of the egg-shell acts as a mordant. To test this point, a piece of ordinary striped mordanted calico was dyed for about ten minutes at a boiling heat with onion skins, when the aluminium mordant became a full bright yellow, the iron mordant a dark greenish olive.

According to Leuch's Farben- und Farbenkunde, 1, p. 434 (1825), the skin of onion bulbs were used at least provincially "in conjunction with alum, for dyeing wollen, linnen, and cotton matterials", a fact which had been forgotten.

In order to learn more about this coloring matter, and if possible to identfy it, Perkin and Hummel have made a careful chemical examination of the substance.

The hot aqueous extract being strained through calico deposits the crude coloring matter upon cooling. It is purified by crystallization from hot alcohol, and by extraction of the ethereal solution by means of aqueous alkali. When pure, the glistening, yellow crystals have the composition $C_{15}H_{10}O_7$, form salts and with fused alkali yield protocatechuic acid and phloroglucinol. The dyeing properties with mordants point to the identity with quercetin.

It is interesting to note with regard to the quercetin group, that whereas fisetin is only known at present to exist in young fustic (*Rhus cotinus*), cuteolin in weld (*Reseda Cuteola*), morin in old fustic and jackwood (*Morus tinctoria* and *Artocarpus integrifolia*), and rhamnetin and rhamnazin in Persian berries, quercetin itself has a much more widely distributed existence. For instance, it has been found present in quercitron bark, Persian berries, catechu and in tea leaves; also in the bark of the apple tree and horse chestnut, and in numerous other natural products. This coincidence, however, may be more apparent than real.

[J. C. S. 69, p. 1290.]

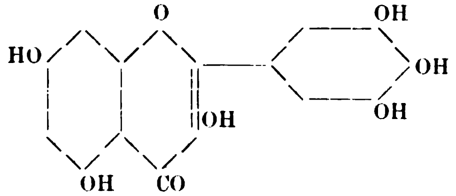
The Coloring principle contained in the Bark of Myrica nagi.

In the course of examining the tinctorial properties of some Indian dye-stuffs, the attention of Perkin and Hummel was attracted by the behavior of the bark of *Myrica nagi*. Not only did the coloring power compare favorably with that of such well-known dye-stuffs as old fustic and quercitron bark, but in some respects it seemed to differ from all other yellow mordant dye-stuffs. *Myrica nagi*, also called *M. sapida*, *M. integrifolia*, *M. rubra* etc., belonging to the Myricaceæ, is the box-myrtle or yangmal of China. It is an evergreen diœcious tree possessing an aromatic odor, and is met with in the subtropical Himalayas from the Ravi eastwards, also in the Khasi Mountains, Sylbet, and southward to Singapore, and distributed to the Malay Islands, China and Japan. The bark is said to have been exported from the North-West Provinces, Kumáon, etc., to other parts of India in recent years to the extent of about 50 tons per annum. In Bombay it is met with under the name of kaiphal, and is there worth 1—2 rupes per maund of 41 lbs, being entirely imported from Northern India. According to Mr. W. Coldstream it is used in Sirmur (Simla district) for dyeing pink, and also as a tanning agent for fancy leather work and for medicinal purposes.

The bark has an astringent taste, and in the powdered condition acts as an irritant on the mucous membrane of the nostrils, indeed it is said to be used occasionally as a snuff in catarrh with headache (Dict. of the Ec. Products of India, G. Watt, 5, p. 309.) The examination made by Perkin and Hummel seems to be the first chemical investigation of this bark.

Myricetin is prepared by exhausting the ground bark with boiling water. The coloring matter is precipitated by means of lead acetate, the lemon-yellow lead compound decomposed with boiling dilute sulphuric acid, and the brown liquid from which the lead sulphate has been removed is extracted with ether. The residue from the ethereal extract is taken up with a little alcohol and the alcoholic solution diluted with boiling water. Upon cooling the crystals separate. These are extracted with small quantities of boiling acetic acid to remove a colorless wax-like substance, and finally recrystallized from dilute alcohol. The yield averaged from 0.23 to 0.27 p. c.

The light yellow, glistening needles have the composition $C_{15}H_{10}O_8$ and melt above 300° with decomposition. Myricetin contains no methoxy groups, forms salts with one molecule of sulphuric or hydrohalogen acids, but hexa-acetyl and hexa-benzoyl compounds. The principal products of the action of fused alkalies on myricetin are gallic acid and phloroglucinol. Dissolved in carbon disulphide it adds four atoms of bromine at 100°. It therefore seems that myricetin belongs to the quercetin series, which contains a catechol nucleus, whereas myricetin contains a hydroxy catechol (pyrogallol) nucleus. The probable formula, therefore, is



The bark also contains 27.3 p. c. of tannin, absorbed by hide. It is also precipitated by lead acetate after precipitation of the coloring matter.

[J. Ch. Soc. 69, p. 1287.]

The Assay of Kola.

The following abstract is taken verbatim from a paper on the caffeine compound of kola presented at the Montreal meeting by A. B. Prescott and J. W. T. Knox.

Preparation of Sample. Slice a sufficient quantity of the fresh seeds in thin papery slices, allowing them to fall in a beaker of boiling alcohol. An ordinary potato slicer is a very convenient and effective instrument for this purpose. Remove the slices after a few moments boiling, and allow them to dry spontaneously on clean glass plates. Distill the alcoholic solution, under reduced pressure,* to a syrupy consistence, and pour it on the sliced drug now being dried, rinsing the flask with successive small portions of alcohol. When dry remove the drug to a mortar, wash the glass plates with a few cc. of hot alcohol, and pour this on the drug, which is to be finely powdered, and preserved in dry glass stoppered jars. The powder prepared in this way corresponds closely to the original color of the seeds, being but slightly paler in each instance. There can hardly be any doubt that it represents correctly the fresh seeds, with subtraction of the water, and perhaps of a portion of the trifling amount of volatile oil they contain.

For Free Alkaloids. Weigh accurately five grams of the sample, transfer to a Soxhlet's extraction tube, and treat for six hours, or until exhaustion is complete, with chloroform. Evaporate the chloroform, and to the residue add 30 cc. of hot one per cent. hydrochloric acid, and filter to remove fat, rinsing out the flask with several small portions of hot water, passing these through the filter, and washing the filter three or four times with hot water. The united filtrate and washings now amount to about 70—75 cc. Concentrate in a porcelain capsule on a water-bath to about 10 or 15 cc., transfer to a graduated cylinder, which has been carefully compared with the burette to be used for the Wagner's reagent, and rinse the capsule with three or four successive portions of hot water, making up the volume in the cylinder to 30 cc. after cooling. Now run in from the burette 30 cc. standard Wagner's reagent, and agitate well. Filter through asbestos after five minutes, and pour the filtrate into the same burette, previously washed and dried. About 55 cc. will be recovered. Run out an aliquot portion of the liquid (say 30 cc.), and neutralize the excess of iodin with decinormal sodium thiosulphate solution, then from the result calculate the number of cc. of iodin solution used. Multiply this number by 0.00485 for the weight of anhydrous caffein. With another aliquot portion of the filtrate make a duplicate titration.

It will be observed that the alkaloids are estimated only as caffein. Theobromin also is precipitated by Wagner's reagent, but its proportion, 1.48 to 100.00 of total alkaloids, is so small that the error introduced by the difference in the factors of the alkaloids is not appreciable.

For Combined Alkaloids. After the exhaustion with chloroform add alcohol of 90 per cent. to the drug, which is still contained in the extraction tube, and continue the treatment until exhaustion is complete, as shown by the absence of color in the portion of menstruum last siphoned over in the apparatus. Two or three hours are usually sufficient. This alcoholic solution may be treated in either of the following ways:

(*a*) Evaporate the solution to dryness in a tared porcelain capsule, and weigh. Take a small portion 0.200 or 0.300 gm.), and determine the amount of nitrogen by combustion. This nitrogen is entirely alkaloidal, as proteid substances are not extracted from the drug by the strong alcohol, and the total nitrogen can be calculated into caffein. From the amount of caffein found by combustion of the aliquot portion calculate the total amount present in the whole extract.

(*b*) To the hot alcoholic solution add an excess of freshly precipitated lead hydroxid (litharge or lead carbonate will not answer), and digest on a water-bath for a few minutes, until the supernatant fluid is colorless. Then transfer to a porcelain capsule, rinse the flask with hot alcohol, mix with clean white sand, evaporate the mixture to dryness, and place the whole in the extraction tube. Treat with chloroform three or four hours, and determine the caffein volumetrically.

A definite volume of Wagner's reagent of known strength is added in excess to the measured caffein solution slightly acidulated with sulphuric or hydrochloric acid, and the clear liquid is decanted off after the precipitate has settled or is filtered through asbestos after five minutes' standing. The excess of iodine is titrated with decinormal sodium thiosulphate solution, using an aliquot portion of the filtrate. From this the number of cc. of decinormal Wagner's reagent can be calculated, which number multiplied by .00485 equals the weight of the anhydrous caffein.

Botany and Pharmacognosy.

Crimson Clover Hair Balls.

Circular No. 8 from the Division of Botany, Department of Agriculture, reports a rather curious ailment in horses occasioned by eating too mature crimson clover. The barbed hairs of the mature calyx, by the action of the stomach, become matted together into the form of felt-like balls which set up in the stomach and intestine where they form and lodge violent and fatal troubles. As many as thirty such concretions have been found in the stomach of a single horse, and in size they may reach four inches. They are, of course, very light, a specimen four inches in diameter weighing less than five ounces. When once formed they act as obstructions in the alimentary tract and no remedy is suggested. By feeding the plant before these hairs become hard and stiff, no danger need arise from the use of the plant.

Poisonous Honey.

In a paper read before the American Pharmaceutical Association at the Montreal meeting, Mr. Lyman F. Kebler discusses poisonous honey. Poisonous honey has been known from ancient times and has been accounted for on very various hypotheses. Asia Minor has been the principal place of origin in the cases mentioned in literature, but the United States has not escaped. During the past year, New Jersey has furnished eight cases. Pennsylvania and South Carolina have also contributed. The symptoms agree in the main features. Dimness of vision, vertigo, delirium, pain in the stomach and intestines, purging and vomiting, retching and general symptoms of collapse are followed in the most severe cases by death.

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* The boiling alcohol kills the ferment and also dries the drug quickly. While it will appear later that this ferment, contrary to the general opinion, has but little if any influence on the production of free caffein from the caffein compound, the use of alcohol has nevertheless been retained as an efficient drying agent, and one that preserves the drug apparently without allowing any chemical change whatever to take place; the object being to avoid the decomposition of the caffein-bearing combination by the hot water remaining after the alcohol is evaporated.

The poisonous article is sometimes marked by a dark, reddish color and a somewhat repulsive odor; at other times neither in appearance nor in odor would it awaken suspicion. The examination of various poisonous samples has revealed the presence of toxic principles. In South Carolina, honey that proved fatal in three cases out of twenty was found to be highly impregnated with gelsemine.

Honey used by persons poisoned not long since at Princeton, N. J., was examined by Kebler who failed to find either alkaloids or inorganic poisons. Tests for andromedotoxin yielded uncertain results. It seems to be rightly suspected since it is widely distributed through the family of the *Ericaceæ* and is present in those plants that have been traditionally condemned by bee-keepers. *Kalmia latifolia*, *Andromeda* species, *Rhododendron* species and various azaleas contain this principle.

Although not positively established by the chemical examination, Kebler regards the flowers of the *Ericaceæ* as the probable source of trouble and bee-keepers are advised to avoid regions where these flowers abound.

Practical Pharmacy.

Skriptol.

A concentrated ink-extract prepared by Krueger in Goldberg. It is a tannin ink to which considerable dextrin and nigrosine have been added. Diluted with 20 to 25 parts of water it can be used as a writing or copying ink. The advantage of the concentration consists in the convenience with which large quantities of ink can be prepared. [Pharm. Ztg. 41, p. 573.]

Anti-Nausea.

Dr. Knoff in the Therap. Monatschr. warns against the use of this remedy, which is distributed on ocean steamers to passengers against sea-sickness. The tablets of which two to five are to be taken every hour are said to contain considerable cocaine, a fact that is manifested even by the local anaesthesia of the mucous membrane of the mouth.

[Pharm. Post. 29, p. 398.]

Mandl's Solution.

As a local anaesthetic for catarrhal mucous membrane Schech uses the three following concentrations of iodine-potassium iodide-glycerin:

Potassium iodide...	1.0	2.0	3.0
Iodine.....................	0.25	0.5	0.8
Glycerin.................	20.0	20.0	20.0

A few drops of phenol or peppermint oil are also added. The medicament is applied by means of a small brush.

[Pharm. Post. 29, p. 396; from Therap. M. Hft.]

Microbe mort.

According to the examination of Dr. Aufrecht of the Chem.-Bacteriological Laboratory of Berlin, the brownish-yellow liquid brought into the market under the above name by Read Holliday and Sons of Huddersfield is a mixture of equal parts of colored carbolic acid and glycerin.

The same firm advertises a medical toilet soap, which has a faint odor of carbolic acid and which proved to be a soda soap containing about 2 p. c. of crude carbolic acid. [Pharm. Ztg. 41, p. 573.]

Bases for Ointments.

The Phrm. Post publishes the following statement of composition of several preparations used as basis for ointments:

a) Adipatum. Anhydrous lanolin, 35 p.; yellow vaselin, 53 p.; white paraffin, 7 p.; distilled water, 5 p.

b) Epidermin. White wax, glycerin, mucilage of gum arabic and water, each equal parts.

c) Mollosin. Liquid paraffin, 4 p,; yellow wax, 1 p.

d) Ung. Lanolini. Anhydrous lanolin, 65 p.; liquid paraffin, 3 p.; white paraffin, 5 p.; distilled water. 30 p.

[Pharm. Post. Post. 29, p. 396.]

Literary.

Books and Pamphlets Received.

Lea Brothers & Co.—Philadelphia. A Manual of Materia Medica and Pharmacology. By David M. R. Culbreth, Ph. G., M. D. With four hundred and fortyfive illustrations. One vol., pp. XI, 818. 1896.

G. P. Engelhard & Co. — Chicago. The Standard Formulary. A collection of over four thousand formulas for pharmaceutical preparations, veterinary remedies etc. By Albert E. Ebert, Ph. M., Ph. D. and A. Emil Hiss, Ph. G, One vol., pp. 500. 1896.

A. Hartleben's Verlag — Wien. Allgemeine Waarenkunde. Handbuch für Kaufleute und Gewerbetreibende. Unter Mitwirkung von Fachgenossen, redigirt von Dr. Josef Bersch.

5. Lieferung: Eis — Fleischleim; pp. 193—240.
6. Lieferung: Fleischmehl—Gombofaser; pp. 241—288.
7. Lieferung: Gommeline—Hyalithglas; pp. 289—336.
8. Lieferung: Hyalophan — Kiefer; pp. 337—384.

Wm. Saunders, Director — Ottawa, Can. Appendix to the Report of the Minister of Agriculture. Reports of the staff of the experimental farms. One vol., pp. 426.

Deutsche Pharm. Gesellsch. — Berlin. Berichte über die pharmakognostische Litteratur aller Länder. Bericht für 1896. I. Theil. Pamphlet, pp. 58.

Schering & Glatz — New York. Silver and Silversalts as Antiseptics. Their bacteriological relations and their application in surgery. An address delivered before the d. Gesellsch. f. Chirurgie by Dr. B. Credé. 1896. Pamphlet, pp. 8.

A. Tschirsch—Bern. Ueber die Bildung der Kalkoxalat-Taschen mit besonderer Berücksichtigung offizineller Pflanzen. Inaugural-Dissertation zur Erlangung der Doktorwürde, vorgelegt der hohen philosophischen Fakultät der Universität Bern. Von Jacob Wittlin. Mit 1 Tafel. Separat-Abdruck aus „Botanisches Centralblatt", Bd. 67. 1896. Pamphlet, pp. 26.

—— Untersuchung über die Sekrete. Mitgetheilt von A. Tschirch.

18. Ueber das Sandaracharz. Von A. Balzer. Besonderer Abdruck a. d. Archiv. d. Pharm. 1896. Pamphlet, pp. 32.

19. Ueber das Palmendrachenblut. Von Karl Dieterich. Besonderer Abdruck a. d. Archiv. d. Pharm. 1896. Pamphlet, pp. 39.

——Zur Chemie des Chlorophylls. Von A. Tschirch. Besonderer Abdruck a. Ber. d. d. Chem. Gesellsch. 1896. Pamphlet, pp. 5.

——Ueber den Unterschied des echten und des giftigen Sternanis. Von Dr. Walter Laursén. Separat-Abdruck a. d. Schweiz. Wochensch. f. Ch. & Pharm. 1896. Leaflet, p. 4.

——Untersuchungen über die Blattfarbstoffe und die Beziehungen des Chlorophylls zum Blutfarbstoff. Von A. Tschirch. Seperat-Abdruck a. d. Schweiz. Wochenschr. f. Ch. & Pharm. 1896. Leaflet, pp. 2.

Central Experimental Farm — Ottawa, Can. Flax. Bulletin No. 25, Department of Agriculture. By William Saunders, Director Experimental Farms.

Author — Phanerogams and Vascular Crytpogams of Australia. By Baron F. von Mueller and Prof. Ralph Tate. Reprinted from Trans. Roy. Soc., South Austr., 16. Pamphlet, pp. 50.

State Board of Health of Mass. — On the Prevention of Tuberculosis. By Jas. B. Russell, Senior Medical Officer of Health, Glasgow. Pamphlet, pp. 49.

Author — The Experience of Several Physicians with Sero-Therapy in Tuberculosis. By Paul Paquin, M. D. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 19.

Author — The practice of pharmacy as a liberal profession. By Dr. F. E. Stewart. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 19.

Author — The eminently scientific nature of our patent and copyright laws. The Klebs antiphthism case. By Dr. F. E. Stewart. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 11.

Gehe & Co. — Dresden. Verzeichniss neuerer Heilmittel, mit kurzer Bemerkungen über Herkommen, Zusammensetzung und Wirkung. Pamphlet, 20. 1896.

Reviews.

Friedrich Mohr's Lehrbuch der chemisch-analytischen Titrirmethode. Von Dr. Alexander Classen, Professor der Chemie an der königl. technischen Hochschule, Aachen. Siebente umgearbeitete und vermehrte Auflage. Ein Bd., pp. xviii, 906. Mit 191 eingedruckten Holzschnitten. Druck und Verlag von Friedrich Vieweg und Sohn, Braunschweig. 1896. M. 35.00.

It does not often happen in this quicklived scientific century that a text-book passes through new editions forty years after the appearance of the first edition, and continues to bear the name of the original author almost two decades after his death. Yet this is the case with the book before us.

Gay-Lussac had worked out his chlorimetry in 1824, alkalimetry in 1828, the determination of silver in 1832, but in spite of their usefulness these methods found but little favor. The use of the permanganate solution for the determination of iron by Marguerith in 1846, and the application of the iodine and sulphurous acid solutions by Bunsen are also milestones in the history of volumetric analysis and assisted materially in placing this important branch of chemical analysis on an equal footing with gravimetric analysis. However, there was little or no system in this important field. Each investigator had adopted arbitrary strengths for his solutions, so that in most instances they bore no relation to each other. To have brought order into this chaotic condition is the desert of Friedrich Mohr, who systematized what was already known, expanded and enlarged this system after it was once established. The results of his labors were given birth in his Lehrbuch der chemisch-analytischen Titrirmethode, published by Friedrich Vieweg und Sohn in 1855.

The fact that the book has been published by the same firm lends a great deal of semblance to the various editions. This can be traced even to the cuts of the first edition, many of which appear again in the latest. That these cuts should have suffered in distinctness by age and continued usage does not seem to detract from the bookmanship, but gives to the latest edition an historic charm that is worth more than perfection of a wood-cut.

Although the general character of the book is much the same there have been numerous changes. These do not become apparent only in new chapters or parts of chapters or the absence of old ones, but in one instance at least in entirely different treatment of the subject matter. The chapter on indicators has been taken from its empiric and has been placed on a more scientific basis, so well presented in Ostwald's Die wissenschaftlichen Grundlagen der analytischen Chemie.

In order to make possible the addition of new methods without materially increasing the volume of the book, the chapters on technical gas analysis, beer, wine, milk, soft coal and peat, which did not at all belong to the domain of volumetric analysis, have been omitted. In order to secure the services of Professor Classen, who had revised the sixth edition, for the revision of the seventh, the publishers have been constrained to raise the price from M. 20.00 to M. 35.00. This may seem unfortunate, yet the value of the book is such as to warrant the increase. The name of the publishers are sufficient guarantee for excellent paper, cuts and press work.
E. K.

Die verbreitetsten Pilze Deutschlands. Eine Anleitung zu ihrer Kenntniss. Von Prof. Dr. **Otto Wünsche.** Druck und Verlag von B. G. **Teubner**, Leipzig. Ein Bd., pp. 112. 1896. M. 1.40.

The object of the author in this small volume is to make the identification of the larger fungi of Germany possible to those who lack technical botanical knowledge. To that end he considers only the most widely distributed forms of the *Myxomicetes, Ascomycetes* and *Basidiomycetes.* The body of the book is a descriptive key to the species in which characters of the fruiting body only are used. The descriptions are condensed and put in simple language. A key to the larger groups and a few of the genera, based on the form of the fruiting body; and another to the genera of the *Agavicaceæ* based on habitat add much to the usefulness of the book.

The mechanical work is good in every respect. In its flexible cloth binding, with light paper and good print, all at a very moderate cost, this little volume may become a useful companion to all who are interested in the identification of the more common fungi of Germany. *L. S. Cheney.*

A Manual of Materia Medica and Pharmacology comprising all Organic and Inorganic Drugs, which are and have been official in the United States Pharmacopœia, together with important allied species and useful synthetics, especially designed for students of pharmacy and medicine as well as for druggists, pharmacists and physicians. By **David M. R. Culbreth**, Ph. G., M. D., Professor of Botany, Materia Medica and Pharmacognosy in the Maryland College of Pharmacy. With four hundred and forty-five illustrations. **Lea Brothers** & Co., Philadelphia and New York. 1896. pp. 818.

As one looks over the output of new text-books during the last few years, he is immediately struck by the attention bestowed on materia medica and pharmacognosy. That a general dissatisfaction with the state of school literature on these subjects exists among instructors, seems to be shown by the numerous attempts to contribute to its improvement. Standing as these branches do at the point of meeting of several roads, chemistry, botany and zoology among others, it is difficult to give these that unity and coherence which makes a subject a thorough satisfaction to teach. With no thread of argument connecting the facts to be presented, they appear merely as disconnected data to be memorized by "main force." This is the light in which the majority of text-books on the subject present the matter; merely a collection of loose facts to be transferred with the utmost expedition to the pupil's memory. Probably at present this style of book is the one most useful, since the preliminary training in the tributary branches is not comprehensive enough to enable the student to connect in any appreciative way these isolated facts with the general subjects to which they stand in relation and a general view of the situation is impossible.

This will remedy itself, we are sanguine enough to hope, as the required preliminary training is increased. Then another kind of text-book in materia medica and pharmacognosy will have a mission, perhaps even now might be used in some instances with profit. But that ideal book has not yet been written.

In the stout octavo volume before us we have a work meant to supply the demand not only for a book useful in the class-room but also for a compendium for the practical use of the modern druggist. All drugs, official now or formerly, are considered. If no longer so, the period during which they were official is given, a bit of information often useful. Drugs from allied species are briefly treated. The most important synthetic compounds as well as the usual inorganic drugs of the pharmacopœia are concisely considered. A chapter on the microscope and its use in materia medica gives brief and valuable directions. An appendix includes a list of poisons and andidotes; rules for converting various units into those of other denominations; a table grouping the leading organic drugs according to their most important constituents; a table of maximum doses; and a list of popular medical abbreviations.

According to the preface, drugs of vegetable origin are taken up according to the natural order of plant classification. The system of Bentham and Hooker has by "a few interjected modifications" been brought into close conformity with Gray's Manual of Botany, and the Coniferæ are "interjected" between the Dicots and Monocots. The wisdom of following a system already regarded by botanists as outgrown and antiquated when the arrangements of either Eichler or Engler and Prantl would have helped to bring the far more natural order before the pharmaceutical students of this country, is open to serious question. That more students are familiar with Gray's Manual than with any other and, therefore, with the unnatural order there adopted, is doubtless true and perhaps this system therefore commends itself for convenience sake. But, in the opinion of the reviewer, to allow the plea of convenience to retard the adoption of modern ideas is giving it in this case too high a consideration. Convenience, solely, is again consulted when doses are given in the apothecaries system and temperatures in Fahrenheit degrees.

The treatment of the various individual drugs is concise. Besides the usual features, the derivation of the botanical names is given and their syllabic accent indicated. Adulterations are briefly described and the chemical constituents are made prominent. The preparations, properties and uses, as well as occasional commercial and historical information of especial interest, receive attention. The inorganic drugs from the mineral kingdom are treated in much the usual manner. The method of manufacture, tests, assays, preparations, properties and uses are given. Organic carbon compounds are likewise taken up, structural formulas and reactions receiving attention. An abundance of good illustrations, some already familiar in other text-books, some new in a work of this kind in this country, add very materially to the value of the book.

All things considered, in spite of those features which the reviewer must beg to question, this is for students in pharmacy schools and as a reference work of limited capacity (it being no competitor with the dispensatories) perhaps the most available work that has come to our notice. By the use of good paper and type the publishers have contributed materially to the value of the book.

Rodney H. True.

The Standard Formulary. A collection of over four thousand formulas for pharmaceutical preparations, family remedies, toilet articles, veterinary remedies, soda fountain requisites, and miscellaneous preparations especially adapted to the requirements of retail druggists. By Albert E. Ebert, Ph. M., Ph. D., and A. Emil Hiss, Ph. G. One vol., pp. 500. G. P. Engelhard & Co., Chicago. 1896.

The favor which Hager's and Dieterich's manuals have found in this country, the sale of the National Formulary of the American Pharmaceutical Association, the space which pharmaceutical journals give to the publication of formulas all indicate the importance of formularies to the practicing pharmacists. However, Hager's and Dieterich's manuals are not only printed in German, but are especially adapted to the German trade. The National Formulary is on account of its very nature as a supplement to the Pharmacopœia limited in its scope. The journals, although they are in a position to publish the most recent formulas, are rather cumbersome for future reference and do not contain their information classified. Furthermore their information is rather that of the copyist and compiler than that of the person who knows himself from experience what the value of a new or even an old formula may be.

It would seem, therefore, that a deficiency existed in American pharmaceutical literature. Whether this gap has been filled by the new formulary before us time alone can demonstrate. It does not only not fall within the province of a review to criticize the individual formulas of the book, but it is an impossibility for the writer as well as for any other person to undertake such a work satisfactorily without making the preparations and putting them to the test of time. To peruse the pages until a few typographical or other errors have been found the writer will gladly leave to others.

As to the general character of the book, it makes on the whole a favorable impression. This might be expected especially from the senior author with his thorough chemical and pharmaceutical training and long years of experience as a practicing pharmacist, who is wide awake to the everyday needs of his calling.

The title gives sufficient indication of the content. The various parts and chapters are as a rule prefaced by a short introduction. In taking from Dieterich and Hager as well as from the various pharmacopœias and formulas what was thought needful and best, the authors have adapted these formulas to the conditions and customs prevailing in pharmacy of this country. If in this adaptation the authors have accommodated themselves to the extent of using the old system of weights and measures rather than the metric system, for the universal adoption of which they as well as all enlightened pharmacists are no doubt striving, we may be persuaded to forgive them sooner than most other writers of books. This book is not at all intended as a text-book as most treatises on pharmaceutical subjects primarily are, but as a laboratory manual for to-day's practicing pharmacists, most of whom know little or nothing about the metric system and mostly have no metric set of weights and measures to work with. It is unfortunate that this should be, and it is to be hoped that if this new formulary finds favor with the American druggist, a future edition may aid in advancing the cause of the metric system in this country, rather than in retarding its cause by accommodating itself to the convenience of the lazy and ignorant. The presswork is neat and should be commended.

E. K.

Zeitschrift für Angewandte Mikroskopie. Herausgegeben von G. Marpmann. Erster Band. April 1895 bis April 1896. Leipzig. Verlag von Robert Thost. M. 7.00.

In view of the increased significance of the microscope in so many directions in the last few years, it was believed that the times were ripe for a periodical devoted to the microscope and to microscopic technique. This journal, appearing monthly, was intended as a central organ which should take cognizance of all articles bearing on the whole subject of microscopy. This proving impossible because of the limited size of the periodical, it seemed best during the current year and thereafter, to give especial attention to the practical phases of the subject, with particular reference to the microscopic investigation of food stuffs, drugs, pathological products and similar objects as well as methods of preservation and preparation of materials for scientific study. Thus the initial volume, in the nature of its contents, differs somewhat from the current volume.

Original articles from the various departments of science in which the microscope is used, abstracts of articles from many sources, descriptions of new apparatus, book reviews and a list of the new literature are among the features of volume one. Among the articles of the year, there are many of interest to pharmacists. This periodical bids fair to be of service to pharmacy in the particular province of drug investigation and should be available to all working with the microscope along these lines.

As a supplement, there has been continued throughout the year, from four to fifteen pages per number, an alphabetical lexicon of applied microscopy. Words from the most varied sources are here very briefly defined. In Vol. 1, forty-eight pages of this lexicon appear, including the letter A.

Rodney H. True.

Berichte über die Pharmakognostische Literatur aller Landen. Herausgegeben von der Deutschen Pharmaceutischen Gesellschaft. Bericht für 1896, I. Theil. Pamphlet, pp. 58, 1896.

As announced in the Proceedings of the German Pharmaceutical Society (V, 1895, p. 186) a pharmacognostical commission of this society has undertaken the collection and publication of abstracts of the new literature bearing on the investigation of medicinal and otherwise useful plants as well as poisonous species. The first part including the articles which have appeared since the beginning of 1896 has appeared. The abstracts are numerous and to facilitate reference are grouped under appropriate headings giving a great amount of information in compact form.

Rodney H. True.

1856

1896

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Suffering from overwork, mental anxiety, etc., will find that one-half teaspoonful in half a glass of cold water—at intervals during the day and upon retiring—will relieve fatigue, both of mind and body.

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Cod Liver oil is an "alterative." Other fats are not. How can the fact be accounted for unless cod liver oil contains something besides fat?

Cod Liver oil is an excellant remedy for copsumption, scrofula, and other wasting diseases. Other fats are not. How can that fact be accounted for unless cod liver oil contains something beside fat?

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Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An illustrated Monthly Journal.
Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY
DR. FREDERICK HOFFMANN AND **DR. EDWARD KREMERS.**

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Published by PHARMACEUTICAL REVIEW PUBL. CO., MILWAUKEE, WIS.
Agents for Europe: JULIUS SPRINGER, BERLIN.

Entered at the Post Office at Milwaukee, Wis., as second class matter.

Vol. 14, No. 11. **NOVEMBER, 1896.** SUBSCRIPTION PRICE, PER YEAR:
UNITED STATES & CANADA, - $2.00.
UNIVERSAL POSTAL UNION, - 2.50.

EDITORIAL.

Schein und Wirklichkeit in der beruflichen und wirthschaftlichen Stellung der deutschen Pharmacie.[1]

Die öffentliche Meinung über die Verhältnisse der Pharmacie und über die Solidarität des Apothekerstandes in Deutschland fusst im fernen Auslande noch immer recht sehr auf den Traditionen der "guten alten Zeit", das heisst während der ersten Hälfte dieses Jahrhunderts. Gehört doch noch heute der kleine Ueberrest derjenigen älteren Veteranen der deutschen Pharmacie, welche derselben im Auslande durch Berufstüchtigkeit und Charakter hohes Ansehen und Geltung erworben haben, der um und nach der Mitte dieses Jahrhunderts stattgehabten Auswanderung an. Mit dem Abtreten jener in strenger Schulung zur Meisterschaft gereiften Repräsentanten der Blüthezeit der deutschen Pharmacie sind freilich auch die alten Ideale im Auslande und vor allen in den Vereinigten Staaten mehr und mehr verbleicht, der Nachschub der Auswanderung hat sich längst als weit minderwerthig erwiesen und das in der Pharmacie Amerika's früher dominirende Deutschthum hat die ehedem massgebende Stellung und Geltung almälig verloren. Der einstige Nimbus der "deutschen Apotheke" ist visionär geworden, indessen die Mythe von der unter staatlichem Schutze in behaglicher Sicherstellung und in opulenter Prosperität gedeihenden deutschen Pharmacie besteht unvermindert fort und gilt dieselbe in der Ferne noch immer vielfach als das beneidenswerthe Abbild pharmaceutischer Vollkommenheit und Glückseligkeit. Auch für diese Illusion gilt wohl das Dichterwort:

> "Was vergangen kehrt nicht wieder,
> Sank es leuchtend nieder,
> Leuchtet's lange noch zurück."

In Wirklichkeit aber beruht das grosse Prestige, welches die deutsche Pharmacie im fernen Auslande noch fort und fort behauptet, längst nicht mehr in der deutschen Apotheke, sondern in der, neuerdings meistens ausserhalb derselben, wirkenden und leistenden wissenschaftlichen Vertreter derselben. Der noch unverwelkte und sich stetig verjüngende, reiche Blüthenkranz der deutschen Fachliteratur überglänzt in die Ferne hin noch immer das grosse Substrat des vielfach in Frohndienste des Kapitals und der Gläubiger vegetirenden Contingents der deutschen Apotheker und des auf dem Vulkane illusorischer Privilegienwerthe in wirthschaftlicher und gewerblicher Misere stehenden Apothekerstandes. Diesen und dessen Existenzkampf um gedeihlichen Fortbestand des von allen Seiten bedrängten und eingeengten Apothekergewerbes übersieht man in der Ferne über die schönen Früchte, welche das Füllhorn der deutschen Fachliteratur und die stille Arbeit der deutschen Universitätslehrer fort und fort in die Welt hinaussenden.

In den Bänden dieser Zeitschrift sind die traditionellen idealen Seiten der deutschen Pharmacie, zuweilen mit mehr Pietät als der Wirklichkeit entsprechend, immerdar hoch gehalten und gepriesen, und die Kehrseite der Medaille und die Realität weniger in Betracht gezogen worden. In dem Oktoberhefte des Jahres 1895 (S. 227) ist indessen die derzeitige gewerbliche und wirthschaftliche Lage des deutschen Apothekerstandes einmal in Kürze in Betracht gezogen worden. Es wurde darüber unter anderem gesagt:

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[1] On account of the direct bearing the above editorial has upon pharmacy in Germany it is published in the German language. Inasmuch, however, as it contains considerable of interest to the American pharmacist, an English translation will appear in the December number. Space does not permit of the publication of both German and English in this issue. *E. K.*

"Der besitzende, vielfach tief verschuldete Theil des deutschen Apothekerstandes strebt nach dem Fortbestande, oder der Ablösung der überkommenen Gerechtsame und Monopolwerthe, ergiebt sich sonst aber mit Resignation in die derzeitige, allem Anscheine nach der Niederlassungsfreiheit zutreibenden Strömung." "Die Unsicherherheit und der langjährige Druck auf die Lebenselemente der deutschen Pharmacie sind aber auch auf den Fortbestand der beruflichen und wissenschaftlichen Interessen und Leistungen nicht ohne Rückwirkung geblieben. Die sprichwörtliche Lust und Liebe zu reger wissenschaftlicher Fortarbeit scheinen sich weniger als ehedem ein Gemeingut des Apothekerstandes geblieben zu sein. Der harte Kampf um Erwerb und für den Bestand des Erworbenen, oder für die Verzinsung übermässiger Hypothekenlasten erfordert mehr mercantilen Geschäftsbetrieb, drängt die Neigung und das Streben nach idealeren Gütern und den einstigen, gepriesenen "Wissenschaftsgeist" des deutschen Apothekers auf den Gefrierpunkt herab, und schafft und vermehrt ein Epigonenthum. Auch der deutsche Apothekerstand zehrt wirthschaftlich recht sehr von der Hand zum Mund, und beruflich von dem Ruhme einer lebensfrischeren und leistungsreicheren Vergangenheit."

Die Verkäuflichkeit der einstigen Privilegien und Concessionen zum Apothekerbetriebe hatten Idealwerthe und Monopole geschaffen, welche schliesslich illusorische Kaufobjecte wurden, und den sogenannten Apothekerschacher herbeiführten, welchem Uebel bei sehr ungleichartiger Interessennahme der Staat, der Reichstag, der Socialismus, einstweilen noch machtlos, gegenüberstehen. Andererseits aber ist die einstige Opulenz der auf eine gewisse Bewohnerzahl begrenzten Apotheken durch die Freigabe des Handels einfacher Drogen und arzneilich oder technisch gebräuchlicher Waaren beträchtlich vermindert, denn es entstanden fortan neben den Apotheken die Drogisten-Geschäfte und deren Zahl ist im Laufe der Jahre so gewachsen, dass zur Zeit auf jede Apotheke im Durchschnitt etwa drei Detail Drogisten Läden bestehen.

Ein anderer Incubus, welcher der amerikanischen Pharmacie fast unheilbare Krebsschäden gebracht und sie mehr als jedes andere Uebel geschädigt hat, ist auch in die deutsche Medicin und Pharmacie eingezogen, — das Geheimmittelunwesen. Dieser uralte und unverwüstliche Missbrauch des Arzneiwesens, welcher auf dem Boden der Habsucht, des Wunderglaubens und der Leichtgläubigkeit der Menschen, wenig vermindert, um in anderen Formen und in modernerem Gewande immerdar fort zu gedeihen scheint, hat auch in die deutsche Apotheke die gleichen Keime der Corrumpirung und der Decadenz gebracht, welche in der amerikanischen Pharmacie so viel Unheil angerichtet und so tiefen Verfall herbeigeführt haben. Dort wie hier aber trägt in dieser traditionellen und wunderbarsten Entartung des Arzneiwesens keineswegs die Pharmacie alle Schuld. Das Wesen der "Volksmedicin"[2] in ihren verschiedenen Stadien, Gestaltungen und Verirrungen ist mit dem Mysticismus von Alters her als ein dunkler Schatten durch die ganze Culturgeschichte wahrnehmbar. Sind auch die Illusionen und die Glaubenssätze des Zeitalters der Adepten und der Iatrochemiker dem Wandel alles menschlichen Irrens und Fehlens anheimgefallen, und hat sich der Arzneischatz auch so manchen wunderlichen und widerlichen Ballastes entledigt, und die Arznei- und Heilkunst vermeintlich gründlich reformirt und geläutert, so bestehen dessen ungeachtet der alte Aberglaube und der stereotype Wunderglaube in alle möglichen Heilmittel, Heilmethoden und Heilkünstler, man mögte fast sagen, instinctiv und mit unverminderter Zuversicht fort. Trotz der viel gepriesenen Höhe des ärztlichen Wissens und Scepticismus, und trotz aller wirklichen oder vermeintlichen Aufklärung sind auch neben dem modernen, wissenschaftlich getauften Specialitäten die alten Geheimmittel gangbare Handelsartikel in deutschen Apotheken verblieben oder geworden, und das keineswegs selten durch die Vermittlung und unter der Aegide von Aerzten, wie das im Auslande eine längst bestehende und die Pharmacie so tief schädigende Erfahrungssache ist.

Indessen ist dies nur eins der vielen und vielleicht nur ein sehr untergeordnetes Element, welche die derzeitige Reformströmung des deutschen Apothekenwesens zur endlichen Lösung drängen. Diese geht vor allem dahin, der seit langer Zeit progressiven Speculation in illusorischen Werthobjecten der Apothekenprivilegien und Concessionen Einhalt zu thun. Die chronische Sentimentalität der dabei in Betracht kommenden Factoren scheint vor der Macht der Thatsachen und der Realität an der Grenze des "*lex tallonis*" angelangt und damit Aussicht zu sein, dass dieses Schmerzenskind des deutschen Apothekerwesens auf seiner national-ökonomischen und financiellen Grundlage endlich einmal *brevi manu* aus der Welt geschafft werde. In dieser Richtung haben die früheren und die derzeitigen Reformvorschläge für das Ausland geringes Interesse und keinen praktischen Werth. Die Missstände, welche den gedeihlichen Fortbestand der Pharmacie gefährden, oder an derem langsamen Verfall mitwirken, sind wohl überall die ähnlichen, nur greift in Deutschland der Staat als controllirender Factor in den gewerblichen Betrieb und Bestand der Apotheken gebieterisch ein, während diese und das Geschick der Apotheker in den Vereinigten Staaten lediglich dem Unternehmungssinne der Leistungskraft und der Willkühr des Einzelnen, und dem natürlichen Verlaufe jeden Unternehmens im Handel und Wandel überlassen bleiben.

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[2] Pharmaceutische Rundschau, 1891, S. 151.

Von Interesse aber dürfte es sein eine Anschauung darüber zu gewinnen, wie wohl, oder wie wenig gerüstet der deutsche Apothekerstand in die ihm offenbar nahe bevorstehende Alternative einer wirthschaftlichen Reform eintritt. Dafür gewährt die kürzlich erschienene Schrift eines im preussischen Staatsdienste stehenden Arztes eingehende und gewiss vielfach überraschende Auskunft. Es ist dies dies die von dem Medicinal Assessor Dr. Springfeld in Berlin verfasste Brochüre *"Zur Entwicklungsgeschichte der Apothekenreform"*[3]. Die durchweg objectiv und offenbar mit voller Sachkenntniss entworfene Schilderung der derzeitigen deutschen Apothekenverhältnisse gewährt unter anderem auch ein klares Bild über die Gefahrenheit und über Symptome eines Verfalles, welche in den verschiedenen Schichten und Schattirungen der besitzenden, wie der conditionirenden, oder in andere Berufs- und Gewerbezweige übergegangenen Pharmaceuten zu bestehen scheinen. Die Schrift bekundet ferner die jedem sachkundigen Ausländer unverkennbare Thatsache, wie sehr sich die deutsche Pharmacie und deren Schwester, der Detail-Drogistenbetrieb, amerikanisirt haben und wie auch diese, nicht minder wie ihre amerikanischen Prototypen, auf hohlem Boden stehen und an ähnlichen Uebeln kranken. Dies ergiebt sich, nicht ohne Belehrung und Warnung auch für die amerikanische Pharmacie, aus den folgende fragmentischen Citaten aus der genannten Brochüre:

"Seit der Loslösung der Chemie von der Pharmacie und der Centralisirung des grössten Theiles der Arzneimittelproduction in der Hand der pharmaceutisch-chemischen Grossindustrie hat sich die Thätigkeit des Pharmaceuten aus den wirthschaftlichen in die mercantile umgewandelt. Aus dem gelehrten Apotheker früherer Zeit wurde ein Zwischenhändler. Selbst die Receptarbeiten wurden eingeschränkt und verloren an wissenschaftlichem Werth, als es der Grossindustrie gelang dispensirfertige dosirte Arzneiformen von fast unbegrenzter Haltbarkeit herzustellen. Der dispensirende Apotheker ist damit vielfach Automat und die deutsche Apotheke zur Heranbildung von Lehrlingen unzureichend geworden."

"Um dem immer mehr den Gelehrtencharacter verlierenden Stande das Ansehen früherer Jahre zurückzugeben, wurde von den Apothekern die Unterrichtsfrage auf die Tagesordnung gesetzt und insbesondere das Maturum verlangt. In einer Zeit, indessen, in der der Beruf immer mehr technische und commercielle Prägung gewann, in welcher seine Ausübung eine immer einfachere, weniger wissenschaftliche wurde, in welcher die deutsche Apotheke immer unfähiger zur Heranbildung des Nachwuchses wurde, war eine solche Forderung um so ungerechtfertigter, als die gesellschaftliche Gleichstellung mit den gelehrten Berufsarten nicht durch das Maturum und das Universitätsstudium an sich, sondern durch die spätere berufliche Thätigkeit bedingt wird. Damit wäre eine Ueberfüllung des Standes wohl beschränkt, indessen auch ein weit unbescheideneres geistiges Proletariat und zu manuellen Leistungen ungeschickteres Personal geschaffen worden. Man gieng noch weiter; die Apotheker strebten darnach, ein Stück der immer mehr Geltung gewinnenden Hygiene sich zu erobern. Die Apotheke sollte ein hygienisches Institut werden, in welchem die auf chemischen oder bacteriologischen Untersuchungen fussenden Diagnosen des Arztes und des Hygienikers gestellt werden, der Apotheker also ein "Berather des Arztes" sein könne. Die Wissenschaft der forensischen und der Nahrungsmittelchemie sollte Leben in die stillen Apothekenlaboratorien zurückrufen, die Beruffreudigkeit und das Ansehen des Apothekers heben. Es waren die alten Träume, von denen die Apotheker nicht lassen können."[4]

"Gegen die im eigenen Lager immer mehr einreissenden Schäden thaten die Apotheker nichts mehr. Seit dem Tode des vieljährigen verdienten Vorstehers des deutschen Apotheker Vereins, Dr. Brunnengräber's[5] war auch die Tactic der deutschen Apothekervereine eine andere geworden. Früher focht man mit Gründen und kam mit positiven Vorschlägen, jetzt werden nur Reden gehalten. Früher konnte ein Andersdenkender mit Genuss lernen von den sachlichen Ausführungen der Apothekervereine; jetzt wendet sich mancher Gesinnungsgenosse ab von dem wüsten Geschrei und von der besonderen Art der richtigen Agitation, die mit Hilfe eines eigenen Agitationsfonds betrieben wird, von den Audienzen, der Prahlerei, der Beeinflussung der Presse und der Abgeordneten, von dem System persönlicher Verdächtigung, der Geringschätzung der Person des Gegners, und *last, not least* von den hierarchischen Bestrebungen des Vereinsvorstandes."

"Die mit dem Rechtsbewusstsein des Volkes und mit der Reichsgewerbeordnung im Widerspruch stehende Verkäuflichkeit der Apotheker-Concessionen hat zur Entstehung von Idealwerthen und zur Verschuldung der Apotheken geführt, das Selbstständigwerden unbemittelter Pharmaceuten verhindert und früher wohlhabende Apotheker zu Vasallen ihrer Gläubiger erniedrigt. Der Geist des Mercantilismus wurde in die Apotheken getragen, ein für ordnungsmässigen Betrieb zu schneller Besitzwechsel trat ein, Geheimmittelschwindel, Kurpfuscherei, Lehrlingswirthschaft, Betriebsunsicherheit waren zu beklagen."

Wenn Dr. Springfeld den Apothekern die Schuld für den Einzug der Geheimmittel und Specialitäten in die deutsche Apotheke allein vindiciren möchte, so ist schon einleitend erörtert worden, dass der Fortbestand dieser Gestaltung oder Entartung des Arzneiwesens ausserhalb der Controlle der Medicin und der Pharmacie, ja des Staates steht. So lange das Arzneiwesen noch den Nimbus des Mysteriösen trägt und mit der Heilkunde noch im Stadium empirischen oder wissenschaftlichen Experimentirens beharrt, so lange werden Aberglaube und Wunderglaube für die wirklichen oder vermeintlichen Heilmittel und Heilmethoden schwerlich aus der Welt geschafft werden können.

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[3] Pamphlet. 83 Seiten. Verlag von Georg Thieme in Leipzig. Preis 35 Cents. 1896.

[4] Diese von den Besten im Berufe hüben und drüben bisher erhoffte und angestrebte Alternative dürfte bei der regen Thätigkeit in medicinischen Kreisen und bei der schnell voranschreitenden Gestaltung der Bacteriologie und deren immer engeren Anlagerung und tieferen Eingreifen in die biologischen und physiologischen Wissensgebiete, für die Mitarbeit des Apothekers unerfüllt bleiben. Das Wesen und alle Beziehungen der Bakteriologie zur Heilkunde und Hygienie liegen so überwiegend auf dem Felde des medicinischen Studiums und Leistens, dass der Apotheker schwerlich noch in nächster Zukunft dafür zur Mitwirkung herbeigezogen werden wird oder kann. Wer dafür Neigung hat und Beruf fühlt, sollte das Studium der einschlägigen medicinischen Hilswissenschaften von vornherein betreten, oder dazu übergehen. Der Weg zu bacteriologischen und hygienischen Berufszweigen wird bald nicht mehr durch die Apotheke gehen. *Fr. H.*

[5] Siehe Rundschau 1893, S. 96.

Nicht mit Unrecht aber mag Dr. Springfeld die Inconsequenz hinsichtlich des Betriebes der Geheimmittel vorhalten.

> "Es waren früher die Apotheker, welche den Geheimmitteln, als einen Eingriff in ihre Domaine, den Krieg erklärten. Als im Jahre 1887 die Ankündigung von Geheimmitteln verboten und deren Verkauf beschränkt wurde, da sind es aber die Apotheker gewesen, welche die Durchführung derartiger Verordnungen erschwerten und schliesslich die Parole erhoben: die Geheimmittel gehören in die Apotheke. Die von der Polizei bedrängten Geheimmittelfabrikanten und Kurpfuscher fanden für ihre Producte ein Asyl in den Apotheken. Je schärfer die Massregeln der Regierung gegen das Geheimmittelunwesen wurden, um so mehr betrachteten die Apotheker den Handel mit Geheimmitteln als ihr Monopol. Dieselben fanden bald aus, dass sich durch Vereinigung von Production und Handel noch bedeutend mehr aus dem Geschäft herausschlagen lässt und wurden zu Erfindern von allerlei Mittelchen. Damit vollzog sich im Apotheker die Metamorphose von Geheimmittelhändler zum Kurpfuscher."
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> "Das Aufhören der Arzneimittelproduction in den Apotheken und die Abhängigkeit des Apothekers von der pharmaceutisch-chemischen Grossindustrie hat dazu geführt, dass die Apotheker jetzt für eine Mehrzahl ihrer Waaren nur eine ungenügende, für die dispensirfertig dosirten und mit Hilfe bacteriologischer Methoden hergestellten Mittel gar keine Garantie übernehmen können und in dieser Beziehung nicht höher stehen als die Drogisten, welche die Mittel aus derselben Quelle beziehen."․․․․ "Zur Heranbildung eines Nachwuchses ist die deutsche Apotheke unzureichend und zwischen den hohen wissenschaftlichen Anforderungen des Apothekerexamens und der manuellen Arbeit, welche der examinirte Gehülfe zu vollziehen hat, besteht ein arges Missverhältniss. Dieses hat ein anspruchsvolles und unzufriedenes Personal entstehen lassen."
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> "Dem grösseren Theile der deutschen Apotheken fehlt der Rechtsboden. Die auf ihnen angesammelten Werthe sind unsichere, vor jedem Reformprojecte erzitternde. Damit muss die Sicherheit des Betriebes auf die Dauer leiden."

Diesen und anderen Uebelständen soll nun durch ein im Kultusministerium ausgearbeitetes Gesetz entgegengetreten werden. Die für dessen Berathung herbeigezogene Commission bestand aus 9 Juristen, 4 Medicinern, 9 Apothekerbesitzern und 6 conditionirenden Apothekern.

Die Grundzüge dieses Entwurfes für eine projectirte reichsgesetzliche Regelung des deutschen Apothekerwesens sind mit den Modificationen und deren Begründung seitens der Commission der Brochüre beigedruckt worden. Dieselben haben an sich für die Pharmaceuten des Auslandes geringes Interesse und keinerlei praktischen Werth. Im Interesse und für das Ansehen der deutschen Pharmacie wäre es aber mehr als wünschenswerth, wenn nach so mancherlei verfehlten Anläufen im Laufe vieler Jahrzehnte, dieses fadenscheinige Problem durch eine möglichst schonende, jedenfalls aber peremptorische Erledigung endlich einmal aus der Welt geschafft würde. *Fr. H.*

ORIGINAL CONTRIBUTIONS.

Application of the Carvoxime-Method for the Quantitative Estimation of Carvone to Adulterated Spearmint Oil.

By *Edward Kremers* and *Oswald Schreiner.*

(Report of Research Committee G, U. S. P. Revision.)

In an earlier report on a closely related subject[*] the writers demonstrated the applicability of the carvoxime reaction to the quantitative estimation of carvone in pure volatile oils containing this ketone. The results obtained by this method possessed such a decided advantage over those obtained by older methods that it deserved further attention and study. A single physical test can easily be circumvented by adulterers. In fact the number of such tests that are necessary to constitute a stumbling block to the adulterer seem to depend very largely upon the ingenuity of the latter. There can be no doubt that the physical tests which have been employed largely in the examination of volatile oils have done admirable service in making possible a better control of the purity of these complex products. But at the very best they are but imperfect evidence: seldom if ever positive evidence of purity and very frequently very poor negative evidence of absence of impurity. A single positive chemical fact as a rule is worth more than half a dozen physical data. This position will no doubt be better comprehended as the chemical nature of volatile oils and the dependence of this chemical nature upon a host of conditions natural as well as artificial, becomes more and more generally understood.

The chemical examination of volatile oils like the study of their chemical composition is still in its earliest infancy. It is therefore of greatest importance to test carefully every method that at least at its surface appears valuable. Not only should such methods be tested at the hands of different analysts, but under a variety of conditions. A chemical method of this kind should not only give good results under ideal conditions as to purity but even with most adulterated products so as to give positive evidence of the extent of the adulteration. It will become apparent from this report that the carvoxime method for the estimation of carvone in volatile oils will give good positive results even in badly adulterated oils and that the absence of crystallized carvoxime denotes practically an absence of carvone.

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[*] This journal, p. 76.]

As long as we know so little about the chemistry of the carvone-containing oils we must rest satisfied with the quantitative estimation of this constituent. No doubt it will become advisable later, as our knowledge of the subject increases, to supplement this test by others.

Inasmuch as so much stress is being laid on the necessity of chemical tests it should be made clear that the value of physical tests is by no means underestimated by the writers, when properly applied. Physical constants are of the greatest importance in the identification of pure substances that are chemical units, but must from the very nature of the case be of secondary importance only in mixtures of unknown composition. This can clearly be illustrated by calling attention to the fact so well known to analysts that e. g. the specific gravity of a wine is in no way a criterion of the purity of a wine nor even of the alcohol content of a wine.

The attention of the authors has been called to the fact that the oils of cedar-wood and of gurjun balsam are distilled on a large scale and that little appears to be definitely known as to the use to which these oils are put. It is supposed that they are used for the purpose of adulteration and it was pointed out that their applicability to the adulteration of spearmint oil might not have escaped the keen eye of the adulterer.

This gave an excellent opportunity to make a test case of the applicability of the method described in the earlier report already alluded to.

The spearmint oil used was a product purified by redistillation. It had a sp. gr. of 0.933, and when assayed according to the carvoxime method showed a carvone content of about 56.30 p. c. The specimens of cedar-wood oil and gurjun balsam oil were kindly furnished by Messrs. Fritzsche Bros. of New York. Specific gravity and rotatory power of these oils are recorded in the appended table. Both oils consist largely of sesquiterpenes. On account of the high boiling points of these hydrocarbons it was thought that they might prove more troublesome than most other constituents of volatile oils in the quantitative isolation of the carvoxime.

Both oils are also lævogyrate. Cedar-wood oil has a lower rotatory power but higher specific gravity, gurjun balsam oil a higher rotatory power but lower specific gravity than spearmint oil. Either of these oils can be added to the extent of from about 10 to 15 p. c. to spearmint oil without bringing the latter seriously out of the limits of the pharmacopœial requirements. It becomes evident, therefore, that by judiciously mixing the oils of cedar-wood, gurjun balsam and spearmint an adulterated oil may result that will possess approximately the specific gravity and even the rotatory power of genuine spearmint oil and yet be a grossly sophisticated product.

Mixtures of spearmint oil with 25 p. c. of cedar-wood oil and gurjun balsam oil respectively were prepared. The carvone content was estimated according to the carvoxime method formerly described†, and also for the sake of comparison by the fractional distillation method. On account of the presence of the high-boiling sesquiterpenes the carvoxime method had to be slightly modified.

Oil.	Sp. Gr. at 20°.	Rotatory power at 20° in 100 mm. tube.	Carvone as oxime.	Carvone fraction 220° to 230°.	Carvone calculated.	Solubility.
Cedar-wood.	0.949	−23°42′	—	—	—	
Gurjun balsam.	0.915	−123°24′	—	—	—	
Spearmint.	0.933	−47°45′	56.40 p. c. 56.20 "	50.28 p. c.		Soluble in alcohol, glacial acetic acid and carbon disulphide in all proportions.
Spearmint containing 25 p. c. cedar-wood.	0.940	−40°9′	40.80 p. c. 40.49 "	27.20 p. c.	42.22 p. c.	do.
Spearmint containing 25 p. c. gurjun balsam oil.	0.929	−65°4′	39.98 p. c. 40.12 "	29.68 p. c.	42.22 p. c.	do.
U. S. P. Requirements.	0.930 to 0.940					With an equal volume of alcohol it forms a clear solution, which is neutral or slightly acid to litmus paper. When somewhat further diluted with alcohol, it becomes turbid. It also yields a clear solution with an equal volume of glacial acetic acid, and with half its volume of carbon disulphide; but with an equal volume of the latter it forms a turbid mixture.
Mixture of 66⅔ p. c. cedar-wood. 33⅓ " gurjnn balsam.	0.938	−55°34′				
Mixture of 50 p. c. spearmint. 33⅓ " cedar-wood. 16⅔ " gurjun balsam.	0.936	−47°30′	29.79 p. c.		28.20 p. c.	

[† loc. cit. p. 78.]

The distillation with water-vapor was continued until the oily portion of the last fractions, collected separately in test-tubes, solidified. These crystals were weighed with the bulk of the carvoxime in the distilling flask.

For the fractional distillation of the adulterated oil 25 g. were used. The fraction distilling within a limit of ten degrees of the boiling point of carvone was collected and weighed. To facilitate comparison the results have been tabulated.

A glance at the table will show that the results obtained by the carvoxime method, while they agree very well among themselves, are somewhat too low. This is due, no doubt, to the presence of the sesquiterpenes which necessitates the longer distillation with water-vapor of the oxime mixture. The sesquiterpenes evidently carry over some of the carvoxime and, keeping it in solution, prevent its crystallization. Whereas the results are not ideal they certainly are fully as satisfactory as might be expected.

Although less was expected from the fractional distillation of the adulterated oils the results fall short by far from the meagre expectations. A comparison of the two methods seems practically out of the question. The influence of the boiling point of the sesquiterpenes upon that of the carvone is by far too great to base any conclusions upon the results thus obtained.

The carvoxime method with smaller amounts of material gives much better results than the fractional distillation method with comparatively large quantities of oil. It is therefore more economic as well as more reliable. Furthermore the oily distillate obtained by the distillation with water-vapor, especially when collected in fractions, can serve conveniently for the examination of the adulterant. In this particular case Wallach's sesquiterpene reaction might be applied to advantage.

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Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Popular Remedies from the Lauraceæ.—Continued.

In der Rinde wurde gefunden: Wasser, 25.128; wachsartige Substanz, 0.195; festes Fett, 0.750; Weichharz, 0.405; Harzsäure, 2.850; Perseit, 0.900; Extract etc., 4.810; Asche, 7.0 Procent. Das Fett hat die Consistenz von Schweineschmalz, ist bräunlich-grün, von angenehm aromatischem Geruch und Geschmack. Auf Platinblech verbrennt es mit sehr lebhafter Flamme von aromatischem Geruch und ohne Rückstand. Mit Schwefelsäure färbt es sich rothbraun, dann eine zähe klebrige, schwarze Masse bildend. Es ist löslich in Petroläther, Benzol, Chloroform, Aether und siedendem absolutem Alcohol. Das Weichharz hat Terpentinconsistenz, ist dunkelgrün, von schwach aromatischem Geruch und beissend aromatischem Nachgeschmack. Es verbrennt ohne Rückstand. Mit Schwefelsäure zertheilt es sich in schwarzen Streifen und die Säure färbt sich hellbraun. Es ist löslich in Aether, Chloroform, Amylalcohol und absolutem Alcohol. Ferner ist in der Rinde eine dem Glycerrhyzin ähnliche Substanz vorhanden, doch ist weitere Untersuchung nöthig, um ein Urtheil darüber abzugeben. Ebenso bin ich überzeugt, dass die frische Rinde ätherisches Oel liefert, doch ist es ungemein schwierig, dieselbe in grossen Portionen zu erhalten, da Niemand den Baum opfern will. Ich konnte deshalb nur aus meinem Garten Material erhalten.

Zehn Kilo frischer Blätter wurden destillirt und nur 0.5 Gram eines stearoptenartigen Oeles, von Lorbeer und Campher ähnlichem Geruch und brennend aromatischem Geschmack erhalten. In den frischen Blättern wurde gefunden: Wasser, 64.0; ätherisches Oel, 0.005; wachsartige Substanz, 1.333; Weichharz, 1.334; Harz, 0.994; Harzsäure, 0.335; Bitterstoff, 0.277; Perseit, 1.700; zuckerhaltiger Extractivstoff, 4.866; Chlorophyll, Extract etc., 2.621; Asche, 3.0. Das Weichharz

In the bark the following was found: water, 25.125; wax-like body, 0.195; firm fat, 0.750; soft resin, 0.405; resin acid, 2.850; perseite, 0.900; extractive, etc., 4.810; ash, 7.0 percent. The fat has the consistence of lard, is brownish-green, of agreeable, aromatic odor and taste. On platinum foil, it burns with a very bright flame, with aromatic odor and leaves no residue. With sulphuric acid, it takes on a reddish-brown color, forming a tough, sticky, black mass. It is soluble in petroleum ether, benzol, chloroform, ether and boiling absolute alcohol. The soft resin has the consistence of turpentine, is dark green, of a faintly aromatic odor and has a biting, aromatic aftertaste. With sulphuric acid, it separates into dark streaks and the acid becomes light brown. It is soluble in ether, chloroform, amyl alcohol and absolute alcohol. In addition, the bark contains a substance similar to glycerrhizin, but a further investigation is necessary before judgment can be given. I am likewise convinced that the fresh bark contains ethereal oil although it is extremely difficult to obtain it in large quantities, no one being willing to sacrifice the tree. Consequently, I could obtain material only from my own garden.

Ten kilos of fresh leaves were distilled and only 0.5 grm. of a stearopten-like oil with an odor resembling laurel and camphor and with a burning, aromatic taste, was obtained. In the fresh leaves was found: water, 64.0; ethereal oil, 0.005; wax-like body, 1.333; soft resin, 1.334; resin, 0.994; resin acid, 0.355; bitter principle, 0.277; perseite, 1.700; sugar containing extractive materials, 4.866; chlorophyll, extractive, etc., 2.621; ash, 3.0 percent. The soft resin is dark brown,

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* Continued from p. 227. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

ist dunkelbraun, von Terpenthinconsistenz, schwach lorbeerartigem Geruch und schwach beissendem Nachgeschmack. Es ist löslich in Petroläther, Benzol, Chloroform, Aether und absolutem Alcohol. Es verbrennt mit aromatischem Geruch ohne Rückstand. Das dunkelgrüne, stark klebende Harz ist geruchlos, von ekelerregendem Nachgeschmack. Es verbrennt ohne Rückstand und ist nur in Aether, Chloroform, Eisessig und Alcohol löslich. Die geruch- und geschmacklose, röthlich braune Harzsäure ist fest, zerbrechlich, und verbrennt mit lebhafter Flamme, Asche hinterlassend. Es löst sich nur in Eisessig, Amylalcohol, Alcohol und Ammoniak. Aus den Blättern ist der Perseit am vortheilhaftesten zu erhalten, in dem die getrockneten, pulverisirten Blätter mit Petroläther, dann mit Aether und schliesslich mit kaltem Alcohol (0.800) extrahirt werden. Der Blätterrückstand wird dann mit destillirtem Wasser vollständig ausgezogen, das Extract bis zum Krystallhäutchen abgedampft und der Kälte ausgesetzt. Nachdem das Perseit von der Mutterlauge getrennt worden, ist nur eine einmalige Krystallisation aus siedendem Alcohol hinreichend reine Krystalle zu erhalten.

Die Samenkerne sind am reichhaltigsten an Perseit, doch ist es ungemein schwierig dasselbe aus denselben gewonnen zu reinigen. Früher wurde der Süssstoff für Mannit erklärt. A. Münz und V. Marvano fanden denselben nicht übereinstimmend und nannten denselben Perseit. Dieselben fanden im Fruchtfleische 1.3 bis 6.8 Procent und in den Blättern 2 Procent Perseit. Den Perseit aus den trockenen Substanzen berechnet, fand ich: Rinde, 1.202; Fruchtfleisch, 4.050; Blätter, 4.722; Kern, 8.858 Procent.

Das Fruchtfleisch mit etwas Citronensaft und Zucker zu einem Brei angerührt, zuweilen auch mit Weisswein, ist nicht allein eine nahrhafte, sondern auch eine wohlschmeckende Speise. Einige Personen geniessen dasselbe auch mit Salz und Pfeffer, doch nie als Suppe und Gemüse wie in Mexico und Mittel-Amerika.

Die Fruchtschale wird vom Volke als Wurmmittel benutzt und zwar mit gleichen Theilen Zucker zur Masse angestossen, theelöffelweise gegeben, dann Ricinusöl. Das Pulver der Samenkerne gilt beim Volke als Aphrodisiacum, dreimal täglich 4 Grammen mit Weisswein genommen. Officinell ist das Fluidextract. Bei Wechselfiebern, während der Apyrexie, giebt man zweistündlich einen Theelöffel voll. Nach Fröhling in Baltimore wird dasselbe äusserlich oder hypodermatisch als schmerzstillendes Mittel bei intercostaler Neuralgie als wirksam gehalten. Hier wird zu demselben Zwecke die Tinctur der frischen Kerne (1:2) benutzt: innerlich 8 Tropfen zweistündlich und Einreibung.

Wird der frische Kern beschädigt, so quellen aus der Wundfläche helle röthliche Tropfen, welche sich sogleich dunkelroth färben und zum Zeichnen der Wäsche benutzt werden. Das Decoct des getrockneten Kernes dient als Getränk bei Blasenkatarrh. Bei Dysenterie wird eine Emulsion von einem Kern, mit einer halben Flasche Wasser bereitet, innerlich verabreicht und zwar zweistündlich ein Esslöffel voll. Halbinnerlich, Morgens und Abends ein Klystier, eine Emulsion von einem Kerne mit soviel Wasser als zu 8 Klystieren erforderlich ist. Ein gerühmtes Aphrodysiacum sind auch die Blumenknospen, welche mit gleichen

with consistence of turpentine, faint laurel-like odor and weak, biting aftertaste. It is soluble in petroleum ether, benzol, chloroform, ether and absolute alcohol. It burns with aromatic odor, without residue. The dark green, sticky resin is odorless, with a nauseating aftertaste. It burns without residue and is soluble only in ether, chloroform, glacial acetic acid and alcohol. The odorless, tasteless, reddish-brown resin acid is solid, brittle and burns with bright flame, leaving an ash. It dissolves only in glacial acetic acid, amyl alcohol, alcohol and ammonia. Perseite is most advantageously obtained from the leaves by drying, powdering, extracting with petroleum ether, then with ether, and lastly with cold alcohol (0.800). The residue of the leaves is then extracted completely with distilled water, the extract evaporated until a film of crystals forms, when it is set in the cold. After the separation of the perseite from the mother liquid a single crystallization from boiling alcohol suffices to give pure crystals.

The kernels of the seeds are richest in perseite, yet it is unusually difficult to purify it when obtained from this source. Formerly this sweet substance was declared to be mannite. A. Muenz and V. Marvano found it to be different from mannite and called it perseite. These authors found in the flesh of the fruit 1.3 to 6.8 percent and in the leaves 2 percent perseite. I found perseite calculated on the dry weight as follows; bark, 1.202 percent; flesh of fruit, 4.050 percent; leaves, 4.722 percent; kernel of seed, 8.858 percent.

The flesh of the fruit, with lemon juice and sugar added, stirred to a broth-like consistency, with the addition sometimes of white wine also, makes not only a nutritious but also a palatable aliment. Some people eat it also with pepper and salt but never as soup or vegetable as in Mexico or Central America.

The peel of the fruit is used by the people as an anthelminthic when ground with equal parts of sugar. It is administered by the teaspoonful followed by castor oil. The powdered kernel of the seed is popularly regarded as an aphrodisiac taken three times daily in 4 grams of white wine. The fluid extract is official. In intermittent fever during apyrexia, a teaspoonful is given every two hours. According to Froehling in Baltimore, it is regarded as effective either externally or hypodermically in relieving pain in intercostal neuralgia. Here the tincture of the fresh kernel (1:2) is used for the same purpose, eight drops internally every two hours, also rubbed in externally.

When a fresh seed is injured, clear, reddish drops ooze from the wounded surface. These take on immediately a dark red color and are used for marking laundry articles. The decoction of the dry seeds serves as a drink in catarrh of the bladder. In dysentery an emulsion of one seed to half a glass of water is administered internally, a tablespoonful every two hours. Semi-internally mornings and evenings as injection, an emulsion of one seed is used with water requisite for eight injections. The flower buds macerated with equal parts of sugar brandy are a prized aphrodisiac. A liquor glassful of the extract is taken with wine. In a

Theilen Zuckerbranntwein macerirt werden. Ein Licörgläschen des Extractes wird mit Wein genommen. In der Dosis von 12 bis 16 Tropfen viermal täglich dient es auch als Emmenagogum. Zu gleichem Zwecke dient auch der Thee der getrockneten Sprossen und Blätter. Diese werden auch als Getränk bei Leberkrankheiten und Milzaffectionen benutzt; ebenfalls äusserlich als Waschung unreiner Wunden. Das Decoct der Rinde wird bei Diarrhoe genommen.

Persea microneura Meissn. Im Staate Rio de Janeiro als *Abacateiro cheiroso* — wohlriechender Abacate (zufolge der wohlriechenden Blüthen) bekannt; doch wird derselbe auch vielfach *Lauro amorello* wie *Persea splendens* benannt.

Dieser 6 bis 9 Meter hohe Baum wird nicht arzneilich benutzt, doch ist das gelbe, schwach Sassafras ähnlich riechende Holz sehr geschätzt zu Möbeln und Bauten, die der Holzvernichter Termite auch unbeschädigt lässt.

Cryptocaria moschata Mart. Diese Pflanze kommt vor in den gebirgigen Urwäldern der Staaten S. Paulo, Minas, Bahia, Espirito Santo und Rio de Janeiro, und ist unter dem Volksnamen *Nos moscada do Brasil* — brasilianische Muskatnuss bekannt. Dieselbe ist ein 10 bis 15 Meter hoher Baum, von Aussehen des Lorbeerbaumes, mit lederartigen, länglich-lancettlichen, zugespitzten Blättern. Der Blüthenstand besteht aus achselständigen, wenigblüthigen Rispen mit sehr kleinen weissgelblichen, wohlriechenden Blüthen. Die Beere, vollständig von der Achse umschlossen, ist einsamig, oben abgerundet und unten zugespitzt. Der Same ist oval und reift im September.

Die frischen reifen Früchte sind etwas kleiner als eine Muskatnuss. Die fleischige, blassgelbliche Cupula welche die Frucht umgiebt, ist 6 mm. dick, von schwach aromatischem Geruch und süsslichem, der Jambofrucht ähnlichem Geschmack. Beim trocknen der Beere fällt diese Hülle ab und es bleibt eine kapselähnliche Frucht, welche den Kern bis zur Keimung umschliesst. Diese Hülle ist hellbraun, der Länge nach regelmässig gerieft, holzig, leicht zerbrechbar. Zwischen dieser holzartigen Hülle und dem Samenkern befindet sich eine kaum ½ mm. dicke Lage eines dickflüssigen, harzigen Balsams, von täuschend ähnlichem Cajeput Geruch und brennend aromatischem Geschmack. Der Same ist mit einer feinen lederartigen Hülle umgeben, hat die Grösse eines kleinen Haselnusskernes, ist im Durchschnitt gelblich, von aromatischem Geruch und pfefferartig beissendem, sehr gewürzhaftem Geschmack.

Eine frische Beere wog im Mittel 12.812 g. Davon beträgt die Cupula (Fleischhülle) 73 p. c., das harzige Epicarp 13 p. c., Balsam und Same 14 p. c. Die reifen frischen Früchte ohne Cupula riechen stark aromatisch, doch ist der Geruch schwer zu beschreiben, fast ähnlich einer Mischung von Lorbeer, Sassafras, Cajeput und Maskatnuss; doch hat derselbe keine Aehnlichkeit mit Pichurim wie einige Autoren bemerken, eher Lorbeer ähnlich.

Die frische, fleischige Cupula, bei 100° getrocknet, verliert an Feuchtigkeit 86.581 p. c.; die holzige, lederartige Schale 48.544 p. c.; der Samenkern 43.936 p. c.

Zehn Kilogram der von der Cupula befreiten, gestossenen Früchte, mit Wasser destillirt, lieferten 37.222 g. aetherisches Oel. Dasselbe ist dünnflüssig, von gelbbräunlicher Farbe, von durchdringendem, aromatischem Geruch und brennend

dose of from twelve to sixteen drops four times daily it acts also as an emmenagogue. A tea prepared from the dried shoots and leaves serves also the same purpose. This is used also as a beverage in liver and spleen affections, likewise externally as a wash for unclean wounds. The decoction of the bark is taken for diarrhoea.

Persea microneura Meissn. In the state Rio de Janeiro known as *Abacateiro cheiroso* — fragrant Abacate (because of its fragrant flowers); it is also often called *Lauro amarello* in common with *Persea splendens*.

This tree, six to nine meters high, is not used medicinally, but the yellow wood with its sassafras-like odor is highly valued for furniture and structures since it is uninjured by the wood-destroying termites.

Cryptocaria moschato Mart. This plant occurs in the primeval mountainous forests of the states S. Paulo, Minas, Bahia, Espirito Santo and Rio de Janeiro, and is popularly known as *Nos moscada do Brazil* — Brazilian nutmeg. It is a tree reaching a height of 10 to 15 meters, resembling the laurel tree, with leathery, oblong-lanceolate, acuminate leaves. The inflorescence consists of axillary, few-flowered panicles with very small, yellowish-white, fragrant flowers. The berry completely enclosed by the axis is one-celled, rounded above and pointed below. The seed is oval and ripens in September.

The fresh, ripe fruits are somewhat smaller than nutmegs. The fleshy, pale-yellow cupule which encloses the fruit is 6 mm. thick, of weakly aromatic odor and has a sweetish taste which resembles the jambo fruit. On drying the berries, this envelope falls off and a capsule-like fruit remains which encloses the seed until germination. This covering is light-brown, regularly marked lengthwise by a "bloom," woody, easily broken. Between this woody envelope and the seed is found a layer, hardly one-half mm. thick of a viscid, resinous balsam with an odor deceivingly like cajeput, burning with an aromatic odor. The seed is enclosed by a delicate, leathery covering, has the size of a small hazel nut, is yellowish in cross section, of aromatic odor with a very spicy, biting, peppery taste.

A fresh berry on the average weighed 12.812 grm. Of this total, the cupule, the fleshly envelope, contributed 73 percent; the resin-containing epicarp, 13 percent; balsam and seed, 14 percent. The fresh ripe fruits without cupule, smell strongly aromatic, having an odor hard to describe, almost like a mixture of laurel, sassafras, cajeput and nutmeg; it has, however, no similarity with pichurim as some authors notice, resembling rather the laurel.

The fresh, fleshy cupule, dried at 100° loses 86.581 percent; the woody, leathery envelope, 48.544 percent; the seed, 43.936 percent.

Ten kilograms of the crushed fruits, freed from the cupule, when distilled with water, gave 37.222 grm. of ethereal oil. This is fluid, of brownish-yellow color, of penetrating, aromatic odor, and burning, spicy taste. Sp. gr. 0.917 at

gewürzhaftem Geschmack. Sp. Gew. 0.917 bei 15.0° C. Sandelroth löst sich in dem Oel mit orangerother Farbe; Jod ohne bemerkbare Reaction. Mit Natrium verdickt sich das Oel gallertartig ohne scheinbar das Metal anzugreifen. Mit Salzsäure geschüttelt zeigt sich keine Reaction. Nach Anwendung geringer Wärme entsteht eine stürmische Reaction, während das Oel eine balsamartige Consistenz und dunkelbraune Farbe annimmt. Mit rauchender Salpetersäure versetzt tritt sofort eine heftige Reaction ein; das Oel verharzt mit gelber Farbe. Gut ausgewaschen besitzt das zähe, hellgelbe Harz einen origanumähnlichen Geruch. Schwefelsäure färbt das Oel purpurroth und es bleibt schliesslich eine weiche, schwarzbraune, harzartige Masse. Schwefelsäure Lösung von Kaliumbichromat färbt das Oel dunkelbraun und entwickelt einen schwachen Bittermandelöl Geruch. Erwärmt man die Mischung so färbt sich dieselbe hellbraun unter Entwickelung eines penetranten, zu Thränen reizenden, aromatischen Geruches. In Alcohol vom Sp. Gew. 0.830 ist das Oel in allen Verhältnissen löslich.

Ferner wurden in den Früchten gefunden:

4 p. c. eines dickflüssigen, braungrünlichen, fetten Oeles, von angenehmem, etwas lorbeerähnlichem Geruche, und unangenehm kratzend, aromatischem, terpentinartigem Geschmack. Sp. Gew. 0.998 bei 20° C. Es erstarrt bei 16° C. zu einer talgartigen Masse. Dasselbe is löslich in Petrolaether, Benzol, Chloroform und Aether, erfordert aber 60 Theile kalten und 28 Theile siedenden absoluten Alcohols zur Lösung, Mit Schwefelsäure färbt es sich rothbraun; mit Kalilauge verseift es mit dunkel orangerother Farbe.

2.575 p. c. eines rothbraunen Weichharzes von Terpentin Consistenz, aromatischem Geruch und beissend bitterem Nachgeschmack. Auf Platinblech erhitzt verbrennt es mit lebhafter Flamme ohne Rückstand. Der Rauch hat einen angenehmen aromatischen, olibanumähnlichen Geruch. Dasselbe ist unlöslich in Petrolaether, Weingeist und Ammoniak; leicht löslich in Benzol, Chloroform, Aether und absolutem Alcohol. Dieses Weichharz bildet die balsamartige Harzmasse, welche die Samen einhüllt.

8.625 p. c. einer dunkelbraunen, festen Harzsäure, von schwach aromatischem Geruch, geschmacklos. Es verbrennt mit lebhafter Flamme und schwachem, etwas sassafrasähnlichem Geruch, Spuren von Asche hinterlassend. Es löst sich nur in Eisessig, Alcohol und Ammoniak.

Das spirituöse Extract der von der Cupula befreiten Beeren mit angesäuertem Wasser behandelt, die Lösung mit Natrium Carbonat versetzt, dann mit Aether ausgeschüttelt liefert nach dem Verdunsten des Aethers feine, farblose Krystallnadeln. Es wurden nur 0.007 p. c. erhalten. Dieselben sind geruchlos, von eigenthümlich bitterem Geschmack. Auf Platinblech erhitzt schmelzen dieselben und verflüchtigen sich vollständig. Dieselben sind löslich in Aether und Alcohol, unlöslich in kaltem Wasser. Beim Sieden löst sich nur wenig und scheidet sich beim Erkalten wieder aus. Sie lösen sich leicht in angesäuertem Wasser. Aus dem wässerigen Decocte der Frucht konnte ich das Product nicht erhalten. Wahrscheinlich ist es das von Dr. Bancroft im Jahre 1887 dargestellte Cryptarin.

Die Infusion der Beeren wird als Medicament bei Dysenterie benutzt, ebenfalls allgemein als

15° C. Sandalred is dissolved in the oil with an orange-red color; iodine produces no noticeable reaction. With sodium, the oil thickens to a jelly-like mass without apparently affecting the metal. When shaken with hydrochloric acid, no reaction is noticeable. On slightly warming an energetic reaction sets in, the oil taking on a balsam-like consistence and a dark brown color. With fuming nitric acid a violent reaction takes place, the oil becomes resinous, with yellow color. When well washed out, the sticky, yellow resin has an origanum-like odor. Sulphuric acid colors the oil reddish-purple and a soft blackish-brown resinous mass remains. Sulphuric acid solution of potassium bichromate gives the oil a dark brown color and developes a faint odor of bitter almonds. When the mixture is warmed, it takes on a dark brown color at the same time developing an aromatic, penetrating odor which by its irritation brings tears to the eyes. In alcohol of sp. gr. 0.830, the oil is soluble in all proportions.

There was further found in the fruits the following:

4 percent of a thickly fluid, brownish-green, fatty oil of agreeable, somewhat laurel-like odor and rough, unpleasant, aromatic turpentine-like taste. Sp. gr. 0.998 at 20° C. It solidifies at 16° C. to a tallow-like mass. It is soluble in petroleum ether, benzol, chloroform and ether; to bring it into solution 60 parts of cold and 28 parts of boiling absolute alcohol are needed. With sulphuric acid it becomes reddish-brown; with potassium hydroxide it saponifies with dark, orange-red color.

2.575 percent of a reddish-brown, soft resin having the consistence of turpentine, an aromatic odor and a biting, bitter aftertaste. Heated on platinum foil, it burns with a bright flame without residue. The smoke has an agreeable, aromatic, olibanum-like odor. It is insoluble in petroleum ether, spirits of wine and ammonia; it dissolves readily in benzol, chloroform, ether and absolute alcohol. This soft resin forms the balsam-like, resinous mass that surrounds the seed.

8.625 percent of a dark brown, solid resin acid of weakly aromatic odor, tasteless. It burns with a bright flame and faint, somewhat sassafras-like odor, leaving traces of an ash. It dissolves only in glacial acetic acid, alcohol and ammonia.

When the alcoholic extract of the berries freed from the cupule is treated with acidulated water, to this solution sodium carbonate added and then shaken out with ether, fine, colorless needle-shaped cyrstals remain after the evaporation of the ether. Only 0.007 percent were obtained. They are odorless, of peculiar, bitter taste. When heated on platinum foil, they melt and volatilize completely. These crystals are soluble in ether and alcohol; are insoluble in cold water. On boiling, but little dissolves and this crystallizes out again upon cooling. They dissolve easily in acidulated water. From an aqueous decoction of the fruit, I could not obtain this product. Probably it is the cryptarin obtained by Dr. Bancroft in 1887.

The infusion of the berries is used as medicine in dysentery, likewise generally as a carminative.

Carminativ. Auch ist es ein sehr beliebtes Volksheilmittel bei chronischem Rheumatismus. Zu diesem Zwecke werden sechs Beeren gestossen und mit einer halben Flasche Zuckerbranntwein macerirt. Von dieser Infusion wird dreimal täglich ein Esslöffelvoll mit Zucker und Wasser genommen. Die Aerzte geben die Tinctur (1:6) dreimal täglich und zwar 5 g. mit Zucker und Wasser. Dieselbe wird zugleich zum Einreiben benutzt. Mit fettem Oel angestossen dienen die Beeren als Magenpflaster. Ein Liniment wird bereitet indem ein Theil Früchte mit sieben Theilen Oel digerirt und dann ausgepresst wird. Dasselbe dient zur Einreibung bei Kolik der Kinder, sowie als Zusatz zu Suppositorien bei Hämorrhoiden. Die mild aromatische Rinde dient als Tonicum sowie bei Blähungen. Dieselbe wird aber wenig als Medicament benutzt, häufiger als Gewürz zu Speisen, da dieselbe einen Geschmack besitzt welcher einer Mischung von Pfeffer und Nelken ähnlich ist. Die Früchte jedoch werden nie zur Würze benutzt.

Das schwere, weissbräunliche Holz ist sehr dauerhaft und sehr gesucht zur Anfertigung von Möbeln. Dieser nützliche, immergrüne Baum sollte cultivirt werden.

Die gleichfalls aromatischen Früchte der *Cryptocaria guyanensis* Meissn., werden auf gleiche Weise benutzt. Dieser Baum wächst in den Aequatorial Staaten Pará und Amazonas und ist unter der Tupibenennung — *Cao-xio* bekannt. Die Rinde soll geruchlos sein. Das gelbliche Holz dient zu Möbeln.

It is also a favorite popular remedy for chronic rheumatism. For this purpose, six berries are crushed and macerated in a half-bottle of sugar brandy. A tablespoonful of this with water and sugar is taken three times daily. Physicians give the tincture (1:6) three times daily, 5 grm. with sugar and water. It is also applied externally. Crushed and mixed with fatty oil, the berries serve as a stomach plaster. A liniment is prepared by digesting one part of the fruits with seven parts of oil and expressing. It is applied externally for colic on children and is also added to suppositories in hemorrhoids. The mildly aromatic bark serves as a tonic and is also used for flatulence. It is, however, little used as a medicine, more commonly as a spice for foods since it has a taste resembling a mixture of pepper and cloves. The fruits, however, are never used as spice.

This heavy, whitish-brown wood is very durable and is much used for making furniture. This useful evergreen tree should be cultivated.

The likewise aromatic fruits of *Cryptocaria guyanensis* Meissn., are used in the same manner as the above. This tree grows in the equatorial states Pará and Amazonas and is known by the Tupi name, *Cao-xio*. The bark is said to be odorless. The yellow wood is used for furniture.

(To be continued.)

Solution of Subacetate of Lead.

By *Carl E. Smith.*

It was noticed, while adjusting a quantity of this preparation to the U. S. P. standard, that there is a lack of agreement between the accepted specific gravity and the strength as determined by the volumetric method given. An investigation was made to determine the reason for this discrepancy, and the results, together with those of other experiments, made in connection with the subject, may be summarized as follows:

1. The specific gravity of a solution containing 25 p. c. of subacetate was found to be higher than that given in the Pharmacopœia, being 1.2485 at 15° instead of 1.195 (U. S. P. 1890) or 1.228 (U. S. P. 1880).
2. The official assay method gave unsatisfactory and misleading results. By a modification the accuracy was increased somewhat, but could not be made to approach that of the gravimetric methods.
3. The quantities of lead acetate and litharge, directed by the U. S. P. of 1890, were found insufficient to make a preparation of the full strength required, when materials of high grade were used and much care taken in the manipulations.
4. It was shown that the solution can be made in nearly as short a time without heat, as it can by boiling, and of as high a strength from the same quantities of materials.

Preparation.—In the formula of the U. S. P. the acetate and oxide are theoretically in molecular proportion to form the compound $Pb(C_2H_3O_2)_2.PbO$, but the solution will necessarily be somewhat less basic than this. The product is brought to a definite weight before filtration and is intended to contain 25 p. c. of this salt, as determined by the amount of lead found, and irrespective of the amount of acetic acid present. Now, if it be assumed that both acetate and oxide are chemically pure and all carbonic acid could be excluded, the highest obtainable strength would be 24.58 p. c., as a calculation will readily show. It would naturally be expected that in practice the strength would fall short of these theoretical figures, but as a matter of fact they are approached quite closely, and may even be exceeded under certain conditions.

By using pure acetate, only slightly deficient in water of crystallization, and litharge, which lost 0.45 p. c. on ignition (water and carbonic acid), with recently distilled water, all in U. S. P. proportions, a number of small experimental lots were obtained, varying in strength between 24.2 and 24.5 p. c., some made by boiling, others by shaking in a bottle without heat.

The insoluble matter in them, consisting mostly of lead carbonate, some insoluble basic acetate and small particles of metallic lead, represented on an average 0.5 p. c. of the product, although one would suppose it to be much more, because of its bulky appearance.

Preparations of the full strength have been reported, claimed to have been made by the U. S. P. process. That this strength has been reached may be explained by the fact that acetate of lead, as found in the market, is often deficient in water of crystallization and occasionally a little basic, which would cause a proportionate increase in the amount of lead in solution.

It is plain, however, that under normal conditions the U. S. P. standard cannot be quite reached. It would therefore seem advisable to increase the acetate and oxide, each by at least 5 gm. for every 1000 gm. of product, if it is expected to be fully up to the required standard, when freshly made.

Digestion on a water-bath, instead of boiling, cannot be recommended, as it requires much longer, usually 5 to 6 hours, unless the mixture is stirred very frequently and much more carbonic acid is absorbed. Solutions made in this way from U. S. P. quantities averaged about 22 p. c.

It may be mentioned in this connection that some pharmacists seem to have an erroneous idea as to what constitutes boiling. An instance came under the writer's notice where a pharmacist considered that he was boiling a solution, when the vessel containing it was immersed in a bath of boiling water.

Cold Process.—To obtain the best results by the cold process, it appears to be necessary to keep the mixture agitated almost constantly until finished or nearly finished. But when this is done, the time required is remarkably short. When kept gently in motion just sufficient to prevent the litharge from aggregating into hard lumps, the product may be completed in 1 to 1½ hour. When this rule as to shaking is not observed, the litharge will "cake" and become covered with a coating of carbonate, which prevents further solvent action of the acetate. The solution is judged to be finished when no more reddish or yellowish particles of litharge are visible and the sediment is of a grayish-white color with perhaps some black particles of metallic lead. There was found to be no particular advantage in a very violent agitation. Solutions made in the way described were finished in nearly as short a time as others were by constant and very powerful agitation in a mechanical shaking apparatus.

Assay.—The official method of titrating with sulphuric acid, using methyl orange as indicator, is far from satisfactory. The color of the indicator will change long before the precipitation is ended, owing to the liberated acetic acid and, moreover, all lead cannot be precipitated from an aqueous solution without an excess of sulphuric acid.

A solution, which contained 24.4 p. c. of subacetate, gave 21 p. c. by this method when the endreaction was placed at a point where the change of color became distinctly visible.

Titration with sulphuric acid, without an indicator, to the end of precipitation, gave 23.5 p. c.

Titration of an alcoholic solution with sulphuric acid, adjusted to contain about 50 p. c. of alcohol at end of titration, gave 24 p. c. This mode of operation and the preceding one are rather tedious.

Titration with decinormal oxalic acid and potassium permanganate gave 23.8 to 23.9 p. c. This proved to be the most satisfactory of the volumetric methods tried. The results were uniformly 0.5 to 0.6 p. c. lower than the gravimetric estimation as sulphate, even when the details were varied considerably. One drawback to its general use is the possible presence of empyreumatic matter in the solution, derived from the acetate. This would vitiate the result, as a certain amount of permanganate would be reduced by it.

The best results by the method were obtained when proceeding in this way:

Weigh about 4 gm. in a 200 cc. graduated flask. Add 80 cc. of $\frac{N}{10}$ oxalic acid, fill to the mark with water and mix well. Let stand until clear, then separate 100 cc. by means of a pipette or by filtration and add to it 10 cc. of diluted sulphuric acid. Heat the solution and titrate the excess of oxalic acid with $\frac{N}{10}$ potassium permanganate. About 4 cc. will be required. 1 cc. of $\frac{N}{10}$ oxalic acid = 0.013662 gm. of subacetate of lead, $Pb(C_2H_3O_2)_2.PbO$.

The gravimetric methods are, of course, to be preferred whenever an accurate adjustment is desired. All estimations of lead mentioned in this paper were made, except when otherwise stated, by precipitating it as sulphate from an alcoholic solution and weighing it.

All these methods do nothing more than determine more or less accurately the amount of lead the solution contains and the Pharmacopœia gives no test to show the extent of its basicity. The official test of precipitation with a solution of gum Arabic proves presence or absence of basic salt, but a solution would not have to contain much of the latter in order to stand the test. A method for estimating, at least approximately, the alkalinity of the solution would therefore be desirable as an addition to the other official tests.

Titration with sulphuric acid, with litmus solution as indicator, is rather unsatisfactory for this purpose, as the litmus is gradually precipitated during addition of the acid. Litmus paper is better, but the change of color is not prompt enough. When enough sulphuric acid was added to change the color of the paper very slightly beyond the neutral point, a ratio of $5Pb(C_2H_3O_2)_2$ to $6PbO$ was indicated in a solution, which was known to contain equal molecules of acetate and oxide with a very slight excess of the former.

Substitution of nitric for sulphuric acid, using litmus solution, would probably give better results, as the lead remains in solution and the endreaction can be seen more distinctly, but the writer has not given this a thorough trial.

Specific Gravity.—The U. S. P. of 1890 gives the sp. gr. of the official solution as 1.195 at 15° and the U. S. P. of 1880 gives 1.228 for a preparation of the same strength. Both are considerably too low.

The sp. gr. of a solution, made by the directions of the U. S. P. of 1890, and containing 24.5 p. c. of subacetate, was 1.2365 at 15°.

The sp. gr. of a solution, standardized accurately to 25 p. c. of subacetate and made by the cold process, was 1.2485 at 15°.

These determinations were made with a sp. gr. bottle of 100 gm. capacity, such as is described by Dr. E. R. Squibb in the Ephemeris, vol. III, p. 1162.

It is judged that a preparation having the sp. gr. of the U. S. P. of 1890, could not be much stronger than 20 p. c.

Brooklyn, N. Y., October 1896.

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Professor George F. H. Markoe.

By *Wilbur L. Scoville.*[*]

Professor George F. H. Markoe was found dead upon the floor of his room in the laboratory of Joseph Burnett & Co., Boston, where he was employed as chief chemist, on the morning of Friday, Sept. 25. He had been in poor health for some time, but pluckily continued at his work, and few suspected his real condition. He was last seen alive on the afternoon of Sept. 24, when he was about his duties at the laboratory, and seemed in his usual health. But he did not appear at his home that night, and a search was instituted for him, which was unsuccessful until the opening of the Burnett laboratories on Friday morning, when his lifeless body was found upon the floor, where it had evidently lain for some hours. The immediate cause of death was apoplexy, and the end was probably painless.

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[*] From data collected by Mr. Jordan.

The funeral was held from the South Congregational Church, Boston, on Monday afternoon, Sept. 29, Dr. Edward Everett Hale officiating, and was largely attended. The interment was at Mt. Auburn Cemetery.

George Frederic Holmes Markoe was born in Valparaiso, Chili, S. A., on Jan. 10, 1840. His early childhood was spent in that country until in 1850, when he came to Salem, Mass., where his education was obtained in the public schools. He began his pharmaceutical career in the store of Mr. James Emerton of Salem, where he immediately began his association with the leading minds of pharmacy through their writings, and a persistent and well-directed course of study on his part.

In 1861 he came to Boston and entered the employ of Mr. Charles T. Carney.

About 1863 he entered the store of Joseph T. Brown, and continued with this firm until 1873, when he became proprietor of the then branch store of the firm on Warren and Dudley streets, in the Roxbury district.

His career in this store was characterized by activity along chemical lines. He was a pioneer in manufacturing pharmacy, and did a considerable business as a maker of chemicals and chemical solutions. Here his process for the manufacture of phosphoric acid by the action of bromine and nitric acid on phosphorus was evolved. His fondness for experiment is shown in the fact that he was the first in this country to manufacture chloral. He also did much analytical work, and was much sought for as counsel in practical methods or improvements in chemical processes.

In 1890 he retired from retail pharmacy and has since devoted himself to his work at the Burnett laboratory, to teaching, and to analytical work.

The early difficulties of his career in the line of study led him to sympathize with the apprentices of few opportunities, and he quickly made his influence felt on their behalf. In 1864 he became a member of the Massachusetts College of Pharmacy, which then existed as an organization, but not as a teaching institution. He immediately urged the establishment of a course of instruction, and succeeded in starting the present institution by a series of free lectures on pharmacy and chemistry, which he delivered to a class of 20 in the spring of 1867. This course was so successful that the college resolved to establish a permanent school of pharmacy, and Mr. Markoe was appointed lecturer on practical pharmacy, and a year later, having himself received the degree of Ph. G., was made permanent professor of pharmacy. His zeal and vigor during these early days of the college has earned him the familiar title of "Father of the Massachusetts College of Pharmacy," a title which fitted him well.

In 1879 Professor Markoe was transferred to the chair of pharmaceutical chemistry, which he occupied until 1892, when he was returned to the chair of pharmacy. His failing health was the cause of his being again transferred in the spring of 1896 to a new position, that of professor of technical pharmacy, where his rich experience in manufacturing and analytical work would still be of value to the college, whilst relieving him of the tedium and drudgery of the regular course. Unhappily he never had the opportunity of entering upon the duties of his office.

He enjoyed an uninterrupted service of 29 years as teacher at the college, and was long accounted one of the mainstays of that institution.

Though of a very sympathetic and social disposition his life was lived literally for the good of pharmacy. He never entertained narrow views of his chosen profession, and was identified with all its branches. He was widely known in the circles of sciences allied to pharmacy, and was an active member of the Boston Scientific Society, the Horticultural Society, the Society of Arts, and of the American Association for the Advancement of Science. He joined the American Pharmaceutical Association in 1863, and served as its president in 1875—76. He was a charter member of the Massachusetts Pharmaceutical Association and of the Boston Druggists' Association, and has acted as president of the latter. He was the founder of the Alumni Association, M. C. P., and its first president.

In 1872 he attended the meetings of the British Pharmaceutical Conference in England, and upon motion of the late Daniel Hanbury was elected honorary member of that body. His visit to England was most auspicious, and he made some valued friends across the water. His visit to Europe was repeated in 1878. His honorary membership in many of the pharmaceutical schools and societies of the United States bespeaks the esteem with which he was held here as well as abroad.

In 1891 Dartmouth College conferred upon him the honorary degree of Master of Arts. He has been a member of the committee of revision of the U. S. Pharmacopœia for nearly three decades, having been actively engaged in the revision of the issues of 1870, 1880 and 1890.

From 1873 to 1879 he acted as instructor in materia medica in the Harvard Medical School.

He was always and ever a student, and in his teaching he was sympathetic and ready to help. He was wonderfully quick to see the practical applications and importance of a new discovery, and though fond of theory he was known as an eminently practical teacher. Among all the students who have received instruction from him, we doubt not one but what has a very warm spot in his heart for Professor Markoe. His work as a teacher and his kindness as a man was never shown to better advantage than to those who had the good fortune to be his apprentices during his proprietorship of the Roxbury store.

Mr. Markoe was twice married. In 1866 he was united to Miss Ellen G. Jennes, and one son, George B. Markoe, now in Colorado Springs, Col., was the fruit of this union. Mrs. Markoe died in 1879 and in 1881 he again was married, this time to an English lady, Miss Louise E. Moore. His widow and a daughter, born in 1893, survive him.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul*.

Greshoff's reaction for iodoform. With silver nitrate, iodoform reacts readily with formation of carbon monoxide, silver iodide and nitric acid.

Griess' reaction for nitrous acid.

I. A solution of a salt of m-phenylenediamine produces a yellowish-brown color with nitrous acid. A 0.5 p. c. solution of the base is prepared with the aid of sulphuric acid, sufficient to produce an acid reaction. If the solution is not colorless, it should be decolorized with freshly burnt animal charcoal.

II. A solution of sulphanilic acid and naphthylamine sulphate is colored red by traces of nitrous acid. The solution to be tested is acidified with sulphuric acid, sulphanilic acid solution is added and after a few minutes, solution of naphthylamine sulphate which has been decolorized with animal charcoal. S. *Lunge*.

Griess' reaction for fæcal matter in water is a 1 p. c. solution of diazosulphanilic acid, which has been made alkaline with soda solution. Water containing fæcal matter becomes yellow within five minutes upon addition of this solution.

Griess' test paper is paper saturated with one of *Griess'* reagents for nitrous acid. (q. v.)

Griess-Ilosway's reagent for nitrous acid is an acetic acid solution of sulphanilic acid and naphthylamine.

Guezda's reagent for albumens consists of nickel sulphate and ammonia.

Guenzburg's reaction for free hydrochloric acid in gastric juice. 2 g. phloroglucose and 1 g. vanillin are dissolved in 30 g. alcohol. If a few drops of this solution are evaporated with an equal amount of gastric juice in a porcelain capsule, the presence of hydrochloric acid is indicated by the formation of a red film.

Guignet's reagent is an ammoniacal solution of copper sulphate.

Gunning's test for acetone. If to the solution to be tested (e. g. distillate from urine) tincture of iodine and ammonia are added, iodoform and a black precipitate of nitrogen iodide are formed. The latter gradually disappears and the yellow color of the iodoform predominates. Alcohol in this case does not produce iodoform. (Comp. *Lieben's* reaction).

Guyon's reagent for the detection of aldehydes is obtained if to a solution of 1 g. fuchsine in 1 liter water a mixture of 20 ccm. sodium acid sulphite solution of 30° Bé and 10 ccm. concentrated hydrochloric acid is added.

If 1 ccm. of this reagent is brought in contact with 2 ccm. of the solution to be tested, the presence of aldehyde is indicated by the formation of an intensely purple-red reaction.

This reagent is also known as *Schiff's* reagent.

Gutzeit's test for arsenic. The substance to be tested is transferred to a test tube containing pure zinc and pure dilute sulphuric acid. The mouth of the tube is closed with a piece of filter-paper moistened with a few drops of silver nitrate solution 1:1. The arsenuretted hydrogen formed if arsenic is present produces a yellow spot on the paper, which is blackened upon the addition of water. (See *Flueckiger's* test for arsenic.)

Frohn's reagent for albuminous substances and alkaloids is prepared by boiling 1.5 g. freshly precipitated bismuth subnitrate with a solution of 7 g. potassium iodide in 20 ccm. water and then adding 20 drops of hydrochloric acid. The orange-yellow solution produces precipitates in the acid solutions of albumen and alkaloids.

Hager's reagent for alkaloids is a solution of picric acid, which produces precipitates in alkaloidal solutions. The same solution can also be used as a reagent for albumen by pouring a layer of the reagent over one of the solution (urine) to be tested. In the presence of albumen a turbidity is produced.

Hager's reaction for colchicine. In concentrated solutions of colchicine, a solution of borax produces a white precipitate. In dilute solution the precipitate is not formed at ordinary temperature, but upon heating to 50°.

Hager's test for alcohol in volatile oils. If a grain of tannin is added to the oil it deliquesces to a sticky mass if alcohol is present. If a drop of the oil is poured into water, the presence of alcohol is indicated by the formation of a milky turbidity.

Hager's test for the purity of alcohol (aniline test). 1 g. cacao oil is dissolved in 2 to 3 g. aniline contained in a test tube and set aside for 1½ hours at a temperature of 15° C. If the oil is pure it floats as a clear liquid layer on the aniline. If tallow, wax, stearin or paraffin are present the oily layer shows granular formations or has solidified entirely.

Hager's test for the hydrides of sulphur, arsenic, antimony and phosphorus. The hydrides formed by the action of zinc and sulphuric acid upon the substance to be tested are allowed to act on parchment paper moistened with solution of silver nitrate. If the resulting brown or black spot is macerated with 10 p. c. solution of potassium cyanide, the color resulting from the action of sulphuretted hydrogen disappears at once, that resulting from the hydrides of antimony and phosphorus disappears gradually (1—2 hrs.), that from the arsenuretted hydrogen not at all.

Hager's arsenic test (Kramato method). A hydrochloric acid solution of arsenic or arsenous acids, when heated gently with a strip of copper, produces a permanganate-like spot. Commercial tin or tin-foil can also be used. Comp. *Reich's* test for arsenic.

Hager's test for cholesterin. See *Salkowski*.

Hager's glycerin reaction. If an aqueous solution of glycerin colored blue by litmus tincture is mixed with a solution of borax likewise colored blue by means of litmus, the mixture assumes a red color. Comp. *Linde's* test for glycerin.

Hager's butter test. (Organoleptic reaction.) A cotton wick is saturated with the liquified fat and ignited. After 2 minutes the flame is extinguished. Pure butter develops the odor of strongly fried butter, margarin that of acroleïn.

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* Continued from p. 230.

Hager's test for glucose is a solution of 30 g. red mercuric oxide, 30 g. sodium acetate, 50 g. sodium chloride, 25 g. glacial acetic acid and 400 ccm. water diluted to a liter. If a solution containing glucose (diabetic urine) is heated with the reagent, a precipitate of mercurous chloride results.

Hager's test for potable water consists in the addition of a tannin solution (1 tannin, 4 water, 1 alcohol). Potable water should not produce a turbidity upon standing even for some time.

Hager has devised numerous other reactions which are occasionally referred to by his name. Those not mentioned here can be found in the well-known hand-books of the author.

Haine's solution for the detection of glucose is a solution of 3 g. copper sulphate, 9 g. potassa, 100 g. glycerin in 600 g. water. Glucose (diabetic urine) effects upon the application of heat the precipitation of red cuprous oxide.

Hammersten's reaction for indican in urine. The urine is mixed with an equal volume of fuming hydrochloric acid, solution of chlorinated lime is added drop by drop, and the mixture shaken out with chloroform. The latter takes up the indigo resulting from the indican and is colored blue. An excess of chlorinated lime is to be avoided. This is also known as *Joffe's* test.

Hannstein's aniline mixture for staining microscopic preparations is a mixture of equal parts of methyl violet or fuchsine, or of 1 p. violet and 2 p. fuchsine. For use, a concentrated alcoholic solution of the mixture is prepared.

Hauchecorne's reaction for cotton-seed oil in olive oil. 6 g. oil are heated with 2 g. pure nitric acid ($3HNO_3$ 40° Bé + $1H_2O$) on a water-bath for 20 minutes. Pure oil remains unchanged or becomes lighter. Adulterated oil assumes an orange-brown-red. Pure oil should solidify within 24 hours to a flesh-colored mass. The nitric acid must be free from nitrous acid.

Hefelmann and Mann's test for fluorine in beer depends upon the precipitation of fluorides as calcium or barium fluoride. Upon treating the precipitate containing fluorides with sulphuric acid, hydrofluoric acid is formed which is recognized by its glass-etching properties.

Hegler's test for lignin. The sections are covered with alcohol and treated with a dilute alcoholic solution of thallium sulphate. Lignin is colored orange-yellow, whereas cellulose and cork remain colorless.

Hehn's chloral reagent for volatile oils and resins. 100 ccm. of alcohol are saturated with chlorine and the resulting hydrochloric acid partly removed by distillation. Then sulphuric acid is added and the resulting metachloral is distilled. Two drops of the latter when brought together with a drop of certain volatile oils or a fragment of some resins produces characteristic color reactions. (*Dragendorff*, Analysis of Plants.) Oil of myrrh, or the petroleum ether extract of myrrh produces a violet color with the reagent.

Hehner's figure denotes the amount of insoluble fatty acid yielded by 100 g. of fat, and serves for the characterization of fats.

Heinrich's solution for the determination of glucose. See *Sachsse's* solution.

Heller's test for coloring matter from blood. Urine rendered strongly alkaline with caustic potash solution yields upon boiling in the presence of the coloring matter of the blood, a reddish precipitate of the alkaline earth phosphates.

Heller's test for albumen in urine. Urine containing albumen, when poured upon heated nitric acid so as to form two layers, will show a white ring at the zone of contact.

Heller-Teichmann's test for blood. Urine containing blood, when heated to the boiling-point with a drop of acetic acid, forms a brownish-red to blackish coagulate. If to this boiling hot liquid a little caustic soda solution is added, it becomes clear and forms a sediment of earthy phosphates which by the adhering coloring matter of the blood appears red to brownish-red in diffused, greenish in direct sunlight.

Heller's test for glucose. Glucose solutions or urine containing glucose are colored yellow to reddish-brown upon heating with caustic potash. Compare *Moore's* test.

Herbst's aconitine reaction. Upon carefully concentrating a solution of aconitine in phosphoric acid, a dirty violet color is produced in the presence of aconine. Pure, crystallized aconitine does not give this reaction.

Hesse's quinine test for the presence of allied alkaloids. These are less soluble in ether, while their sulphates are more readily soluble in water than the corresponding quinine salt. Shake 0.5 g. of quinine sulphate with 10 ccs. of water of 50°—60° C.; after standing 15 minutes, filter off 5 ccs., add 1 cc. ether (sp. gr. 0.7203) and 5 drops of ammonia water (sp. gr. 0.96). The presence of quinidine, conchonine etc. is indicated by the immediate or gradual formation of crystals in the ethereal layer.

Herapath's quinine reaction. Alcoholic solutions of quinine yield upon the addition of tincture of iodine, crystalline precipitates of quinine iodo-sulphate. This separates in thin plates, of a green color at ordinary temperatures, brownish-red at 100° C. and possessing strong optical properties. For the microscopical examination of the urine, this, after being rendered alkaline, is shaken with ether, the ether evaporated and a portion of the residue dissolved on the cover glass in a drop of a mixture of 11.25 g. acetic acid, 3.75 g. alcohol, and 6 drops of dilute sulphuric acid. To this is added a small drop of tincture of iodine.

Heydenreich's test for foreign oils (cotton-seed oil) in olive oil. Allow a few drops of the oil to be tested to fall upon some pure sulphuric acid which covers a surface, about the size of a dollar, in a porcelain capsule. In the case of pure oil, the zone of contact is yellowish-green; with oils derived from seeds, it is yellowish-orange to brown.

Heynsius' test for albumen in urine. Boil 5—10 ccs. of the filtered urine with a few drops of dilute acetic acid and then add a saturated solution of common salt. A white precipitate results in the presence of albumen.

Hilger's test for coloring matter from the bile. The coloring matter is precipitated by boiling with barium hydroxide. The yellow precipitate, filtered and washed, gives the following reactions: Upon treating with alcohol and a few drops of sulphuric acid, the precipitate is rendered colorless while the solutions becomes green. If the precipitate is treated with nitric acid containing nitrous acid, green and blue colors result. (See *Gmelin.*)

Himmelmann's arsenic test. See *Marsh's* test.

Hirschsohn's test for acetanilid in phenacetin. 0.1 g. phenacetin are dissolved in 10 ccs. water, the solution filtered after cooling, and treated with bromine water until a yellow coloration results. If the solution becomes turbid, acetanilid was present (formation of p.-bromacetanilid).

Hirschsohn's test for chloral alcoholate in chloral hydrate. 1.0 g. chloral hydrate is tested with 1 cc. nitric acid (sp. gr. 1.38). If at the room temperature or upon warming a yellow color results within 10 minutes, alcoholate was present.

Hirschsohn's test for pine resin in guaiac resin and balsam of tolu. A very finely powdered sample is shaken for 10–15 minutes with 4–5 times its weight of petroleum ether. In the presence of pine resin, an aqueous solution of copper acetate produces a green color in the filtrate.

Hirschsohn's test for fatty oils in balsam of copaiba. 20—40 drops of the balsam are boiled with 1—2 ccs. of a solution of 1 p. NaOH in 5 p. of 95 p. c. alcohol. The presence of oils is indicated by a jelly-like mass separating or a turbidity being produced, upon cooling or by the addition of 2 volumes of ether. Pure copaiba balsam with 3 vol. of 90 p. c. alcohol should yield a mixture from which no oil globules should separate within an hour.

Hirschsohn's test for gurjun balsam in copaiba balsam. 1 vol. of balsam, 3 vol. 95 p. c. alcohol and 1 g. crystallized stannous chloride are boiled together until complete solution results. Admixtures of gurjun balsam are shown by the appearance of a red coloration, changing to blue upon standing.

Hirschsohn's test for gurjun balsam. 2 ccs. of a solution of conc. sulphuric acid in acetic ether (1–5), when added to 3–4 drops of gurjun balsam, causes a violet coloration. For testing copaiba balsam, add 6—8 drops of the balsam to a solution of 2 drops sulphuric acid in 4 ccs. acetic ether. A violet color indicates the presence of gurjun balsam.

Histed's reaction for nataloin. If nataloin is dissolved in conc. sulphuric acid and a small crystal of potassium nitrate be added, a green color is produced, gradually changing to red and then to blue.

Hlasiwetz's hydrocyanic acid reaction. If an alkaline cyanide solution is warmed with picric acid, a blood-red color results.

Hoffmann's reagent for albumens and phenols is a solution of mercuric nitrate containing a trace of free nitrous acid. Yields similar color reactions as *Millon's* reagent. See *Hoffmann's* reaction for tyrosin.

Hoffmann's reaction for chloroform. If traces of ammonium chloride and ferrous chloride are warmed with a saturated solution of alcoholic potash and a few drops of chloroform, then the mixture diluted with water and rendered acid with hydrocyanic acid, a greenish-blue coloration results.

Hoffmann's reaction for phenol. Phenol with concentrated sulphuric acid and potassium nitrate gives a violet coloration.

Hoffmann's reaction for tyrosin. The hot aqueous solution of tyrosin (obtained from the sediment of urine) produces a red colored precipitate upon the addition of a solution of mercuric nitrate with some potassium nitrate.

Hoffmann's test for primary amines. Upon evaporating an ethereal solution of a primary amine base with carbon bisulphide, dissolving the residue in water, and boiling this solution with silver nitrate, mercuric chloride, or ferric chloride, an odor of mustard oil appears.

Hoffmeister's mixture for the solution of cellulose consists of hydrochloric acid with potassium chlorate.

Hofmann's aniline reaction. With fuming nitric acid, aniline gives a deep blue solution, becoming yellow upon warming and finally turning red.

Hofmann's isonitrile reaction for primary amines. These yield upon warming with chloroform and alcoholic potash the characteristic odor of isonitrile.

Hoehnel's reagent for lignin is phenol-hydrochloric acid (a highly concentrated solution of phenol in fuming hydrochloric acid). Lignin is colored green by this reagent.

Holde's test for unsaponifiable substances in fats. Boil a piece of caustic potash the size of a pea in 5 ccs. of absolute alcohol until completely dissolved, add 3—4 drops of the fat to be tested and boil for one minute. Upon diluting with 3—4 ccs. of water, a turbidity indicates the presence of an unsaponifiable substance.

Holde's reagent for tarry constituents of lubricants obtained from petroleum. Dissolve in petroleum ether in which the tarry admixtures are insoluble.

Hoppe-Seyler's test for biliary coloring matter. The urine is precipitated with milk of lime, the excess of lime precipitated with CO_2, the precipitate filtered and washed with water. If nitric acid containing nitrous acid is dropped upon the precipitate on the filter, the well-known color reactions are produced if coloring matter from the bile is present. See *Gmelin.*

Hoppe-Seyler's test for sugar in the urine depends upon the formation of indigo when urine containing grape-sugar is heated with o-nitrophenylpropiolic acid. The reagent employed is a ¼ p. c. sol. of this acid in soda lye. 5 ccs. of this solution are boiled with a few drops of urine; in the presence of sugar an indigo color is produced.

Hoppe-Seyler's phenol reaction. A spruce shaving is colored blue when moistend with phenol and hydrochloric acid.

Frommasi's modification: Instead of hydrochloric acid, a mixture of 50 ccs. hydrochloric acid, 50 ccs. water, and 0.2 g. potassium chlorate is employed in the above.

Hoppe-Seyler's test for carbon monoxide poisoning. A few drops of the blood to be tested are mixed in a porcelain capsule with an equal or double quantity of caustic soda solution. In case of poisoning by carbon monoxide, the blood will appear of a vermillion color in thin layers, while normal blood will look a dirty brownish-green.

Horsley's test for glucose. Glucose solutions, or urine containing the same, are colored green upon being boiled with caustic potash and potassium bichromate.

Horsley's test for nitric acid. Pyrogallic acid and sulphuric acid yield a violet color with aqueous solutions containing traces of a nitrate.

Houzeau's ozone-paper is red litmus paper, one half of which has been dipped into a solution of potassium iodide. Since ozone liberates free alkali from potassium iodide, the paper will turn blue in the presence of this gas.

Howie's test for curcuma. 0.3 g. of the powdered rhubarb or insect-powder to be tested are heaped upon filter paper in the form of a cone, 50 drops of chloroform are gradually dropped upon this heap, and after drying and removal of the powder, a small piece of borax is placed upon the spot and a drop of hydrochloric acid added. The appearance of the well known red coloration indicates curcuma. *Maisch's* test resembles this one.

Huber's reagent for free mineral acids is an aqueous solution of 5 percent each ammonium molybdate and potassium ferrocyanide. Mineral acids cause in this solution a red turbidity or a brown precipitate, depending upon the quantity present. Boric and arsenious acids do not give this reaction.

Huebl's iodine number serves for the estimation of unsatutated compounds in a substance (oils, resin and the like), and depends upon the power of these compounds of adding iodine. The iodine number of a substance in the quantity of iodine which 100 parts of the substance will take up.

Huefner's reagent for urea is a freshly prepared solution of sodium hypobromite, made by adding 25 g. of bromine at once to a well-cooled solution of 100 g. of sodium hydroxide in 250 g. of water. This solution decomposes urea into CO_2 and nitrogen, the former being absorbed while the latter is measured in a suitable apparatus (*Knop's* azotometer, *Esbach's* ureometer) and the amount of urea thus quantitatively estimated.

Huehnefeld's turpentine solution for testing for blood. Ten volumes each of oil of turpentine, alcohol, and chloroform, are mixed with one volume of glacial acetic acid, and then water added drop by drop as long as the liquid remains clear. The liquid (urine) to be tested for blood is mixed with a few drops of the turpentine solution and a few drops of tincture of guaiac added. A dark blue coloration of the milky mixture indicates blood.

According to *Schär* the test is applied by adding to the suspected liquid a 1 percent solution of guaiac resin in absolute alcohol, and shaking the resulting precipitate, after filtration, with the above mentioned turpentine solution.

Hume's reagent for arsenious acid is a solution of silver nitrate to which is added ammonia water until the precipitate first formed is just redissolved. Arsenious acid with this solution produces a yellow precipitate.

Huppert's test for coloring matter from the bile. The urine is treated with milk of lime or with calcium chloride and ammonia, whereby in the presence of biliary coloring matter, a yellow precipitate of bilirubin-lime is formed. By means of hot alcohol containing sulphuric acid, this is dissolved to a green solution. After the administration of senna or rhubarb, the precipitate with lime is of a rose-red color; the subsequent solution is orange-yellow.

Husemann's morphine reaction. Morphine is heated with concentrated sulphuric acid and after cooling a drop of nitric acid is added. A beautiful dark violet color results, changing to a blood red and gradually fading.

Jacobsen's test for fatty oils. The fatty oil is brought in contact with rosaniline acetate, which is insoluble in neutral fats but is dissolved by free fatty acids.

Jack's test for sugar in the urine consists in identifying the sugar by means of phenylhydrazine, with which it forms a difficultly soluble osazone.

Jacqemart's reaction for distinguishing ethyl from methyl alcohol. Upon heating ethyl alcohol with a solution of mercuric nitrate, the mercuric salt is reduced and a black precipitate results upon the addition of ammonia. Methyl alcohol does not give this reaction.

Jacquemin's aniline reaction. Upon treating a dilute aqueous solution of aniline with a solution of chlorinated lime and then adding a very dilute solution of ammonium sulphide, a rose-red color appears, even in dilutions of 1:250,000.

Jacquemin's phenol reaction. To the liquid to be tested add some aniline, and then a few drops of a solution of sodium hypochlorite. In the presence of phenol a blue color results, which changes to a red upon the addition of acids.

Jahr's test for determining the melting point of butter. See *Drouot's* test.

Jaffé's test for creatinine. In the presence of creatinine, urine gives with an aqueous solution of picric acid and a few drops of soda lye a red coloration, becoming yellow upon the addition of acids. See also *Weyl's* test.

Johnson's reaction for sugar in urine. Upon heating diabetic urine with picric acid and potassium hydroxide solution, a deep red color appears. To remove other reducing substances, *Johnson* recommends the separation of uric acid and creatinine by means of mercuric chloride; after standing for some time and filtering, the excess of corrosive sublimate is precipitated with ammonia, and the solutions now tested as above mentioned.

Jolles' reagent for acetone depends upon the precipitation of the acetone with phenylhydrazine.

Jolles' reagent for albumen in the urine consists of corrosive sublimate 1.0 g., succinic acid 2.0 g., sodium chloride 1.0 g., water 50.0 g. To apply the test, 4—5 ccs. of the filtered urine is poured into each of two test tubes, 1 cc. acetic acid added to each, and then the mixture shaken up, in one case with 4 ccs. of the reagent, in the other with 4 ccs. of water. By comparison of the two samples, traces of albumen (1:120,000) can be identified. Compare *Spiegler's* reagent.

Jolles' test for coloring matter from the bile. The urine to be tested (50 ccs.) is shaken for several minutes in a glass cylinder with a few drops 10 p. c. hydrochloric acid, 5 ccs. of pure chloroform and a saturated solution of barium chloride. After standing for 10 minutes, the chloroform together with the precipitate is removed by means of a pipette, and the chloroform evaporated off in a test tube on a water-bath. After standing at the room temperature for some time, the watery portion of the residue is decanted from the lumpy precipitate. This latter is distinctly colored even when only 1 p. c. of gall is present in the urine; upon the addition of 3 drops of concentrated nitric acid to which ⅓ vol. of fuming nitric has been added, the characteristic green and blue rings are formed.

Jolles' test for iodine in urine. The urine is tested with an equal volume of hydrochloric acid and a few drops of chlorine water added. In the presence of iodine a brown ring results, which colors starch solution blue.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

East Indian Drugs.*

Lawsonia inermis L. (**Lythraceæ**). The leaves furnish Hennah, a dyestuff which has long been a favorite in the Orient. With it the women color the nails of their hands and feet. It is also used for dying the hair, beard and skin as well as for coloring leather. The leaves seem to be put to no important medical use. They are used, however, in dropsy and are applied externally in leprosy, also to wounds and ulcers. Their most important ingredient is probably a tannin of glucosidal character which has been called hennotannic acid. They also contain 2 percent of a resin which is colored green by chlorophyll. The leaves reach a length of 6 cm. and a breadth of 2.5 cm., are acuminate, ovate, narrowed into the short petiole. The secondary veins branch off from the mid-vein at an angle of about 60°. In the outer half they curve toward the top and unite with the next higher vein. The mid-vein has fibres only on the under side. The vascular bundle is bicalatual, the woody part crescent-shaped. The epidermis cells of both sides are rectilinearly polygonal and have stomata. The upper side has two rows of palisade cells, in the spongy parenchyma are two layers of ovalate sacs, very characteristic for this leaf.

Mangifera Indica L. (**Anacaideaceæ**). The ripe fruits with a slight, characteristic turpentine taste, are the mangoes so much esteemed as a fruit in the tropics. When unripe, as are those before us, they serve as an astringent, plainly by reason of their considerable tannin-content. The taste is also somewhat peppery. The single fruits are a few centimeters in size, wrinkled by drying, of a blackish color, the embryo still only slightly developed. In the wall of the fruit are many schizogenetic, secretory reservoirs. The dried flowers, likewise at hand, are also used as an astringent, especially in diarrhoea.

Plantago Ispaghul Roxb. (**Plantaginaceæ**). This plant is native in India and Persia. The species name *Ispaghul* is Indian. Because of the slime present, the seeds of this plant are used internally also when roasted, as a remedy for diarrhoea; externally as an application in rheumatism. The seeds are 3 mm. long, 1 to 1½ mm. wide, pointed, oval, arched on the back, on the front side curved in from the two long sides; in the middle of the furrow so formed is found the small chalaza. The color is a dull, grayish-brown; on the back is an oblong-oval, bright, reddish-brown spot. The epidermis of seed coat on the back side is modified to slime cells, whose content, as is the case with other species, on swelling appears stratified. The seed coat encloses the endosferm in which the small embryo lies. The valuable constituents of this species is the slime contained in the seed coat and it appears that it is here present in especially large quantities. It could otherwise scarcely claim superiority to other species, for example, *P. Psyllium*.

Psidium porniferum L. (**Myrtaceæ**). This plant like all the other species of the genus is a native of America. For a comparatively long time, however, it has for the sake of its palatable fruit been cultivated in the tropics, an undertaking which offers no difficulties on account of the easily germinating seeds. It should also be remarked that botanists regard *P. porniferum* not as a separate species, but only as a form of the guava, *Psidium guayava* Raddi. The root bark and the leaves are before us. Both enjoy in India, the leaves also in the West Indies, a considerable reputation as an astringent, the root bark especially in cases of diarrhoea in children, the leaves as a fever remedy in kidney diseases. They are used externally in rheumatism, also in epilepsy, St. Vitus dance and cramps in children. We know of no especial examination of *P. porniferum*. Probably, however, the plant does not differ materially as to its constituents from *P. Guayava*, the bark of which contains 27.4 percent of tannin.

The leaves have short petioles, reach a length of 12 cm., a breadth of 5½ cm., broad, oval, acuminate, entire, the margin somewhat thickened. Examined with the lens they are transluscently punctate. The odor is faint, resembling that of senna leaves; the taste bitter aromatic. The structure shows nothing especially characteristic. Especially around the mid-vein oxalate in sacs and in separate crystals is noticeable. The vascular bundles show near the phloem and xglem parts a layer of bast fibres. In the mesophyll, secretory reservoirs of a type common to the *Myrtaceæ* are found. The bark forms small pieces of a millimeter's thickness, varying exteriorly from greenish-brown to greenish-gray, on the inside light brown. The cross section shows a thin cork composed of three or four layers of flat cells with brown contents. Plainly an abundant cortex formation takes place, since the bast joins immediately onto the cork. The medullary rays are 1 to 2, rarely 3 cell rows wide, the cells radially elongated, 9 to 17 (rarely) cell rows high. The bast rays show a very distinct stratification. One can distinguish tangential layers of crystal-bearing cells which in the dried drug contain much air and, therefore, appear almost black, and layers free from crystals in which the sieve tubes are found. In longitudinal section, two forms of crystal cells are seen; those present in considerable number (as many as 8) one above another containing one crystal each, and more isolated cells containing small crystals in large numbers. In the deeper parts of the bast, one or more narrow zones of small, strongly thickened, pitted, stone cells appear. The bark has no secretory reservoirs. As far as the not entirely clear description of the bark of *P. Guayava* by Dymock (Pharmacographia Indica II, p. 31) allows a conclusion to be drawn, the two agree as was to be expected.

Salvadora oleoides Dcne. (**Salva loraceæ**). This shrubby plant is found in Pendschab and in Afghanistan. Leaves, bark, fruit and oil find medicinal use. The bark of the root as well as the fruit are before us. According to many accounts, they are used in India as a vesicant. This plant is said to have a cress-like odor and a sharp taste. Our specimens lack these characteristics. The pieces are odorless, of weak taste, but distinctly salty. In spite of repeated mastication, no sharpness was noticed. Nevertheless, we believe that the bark before us is genuine since the structure about to be described agrees well with the account given by

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* [Continued from p. 231.]

Dymock (Pharmacographia Indica II, p. 382) and by Moeller (Baumrinden, 126) of the stem-bark of *Salvadora Persica* Garcin. It is, therefore, to be supposed that the above constituents in which the characteristics given consist are of a temporary nature and disappear upon long preservation by which probably the medicinal value is likewise affected. The dried bark contains some alkaloid, its content was found to be 0.109 percent. Tannin is lacking. Dymock attributes the action of the fresh bark to tiomethylamin present. The bark is about 1 mm. thick, exteriorly grayish-yellow with soft cork. In young pieces, the cork is narrow; the cells throughout are thin-walled. Older pieces show abundant cork formation which extends into the bast. The middle bark consists of parenchyma some cells of which contain starch. The medullary rays in the bast reach a width of 3 cells, becoming broader toward the outside, the cells little elongated radially. The bast rays in the younger barks consist exclusively of soft bast with isolated, strongly thickened, much pitted, axially elongated stone cells which in the older barks appear in greater numbers but never united into groups. We, as well as Moeller, could find but few sieve tubes. The fruits are said to act as a diuretic and are used especially in gravel. An oil which they contain is used for rheumatism and after confinement (obviously externally). The oil-content of the fruit is 27.77 percent. The oil is of a grayish-yellow color, with agreeable, mild taste, at usual temperatures solid, melting at 38°. The alkaloid-content of the fruit is greater than that of the root bark; it was found to be 0.58 percent. Unfortunately in both cases, the quantity present was so small that it was impossible to pursue further investigations. The usual reactions for alkaloids (mineral acids alone and in combination with iron chloride, bromine and potassium hydroxide, etc.) give no noticeable results. The fruits are 6—7 mm. long. 4 mm. thick, yellowish-brown to brown, smooth or wrinkled; at the base are found the fruit pedicel, sometimes 2 mm. long, and the remains of the calyx. The fruit covering is thin, papery and brittle and encloses an albuminous seed with thick cotyledons which envelope the radicle.

Soymida febrifuga Juss. (**Meliaceæ**). Indigenous in India and Ceylon. The tree bears the name redwood and in India it is called Rohan, Shem-maram, Chevemanu, Somida-manu. The bark, which is said to have a bitter, aromatic taste, is used as an astringent and tonic and even also as a substitute for Peruvian bark in intermittent fevers, in diarrhoea and dysentery. There have been upon the market in the past various sorts of bark purporting to belong to this tree. This is evident since the descriptions which lie before us, as far as they concern the anatomical features of this drug, differ very considerably from one another as well as from the bark under immediate consideration and from a specimen coming from the pharmacognostical collection of the Polytechnicum at Zuerich. The descriptions by Moeller (Baumrinden, p. 264) and by Lanessan in the Remarks upon the French translation of Flückiger and Hanbury's Pharmacographia (II, p. 304) plainly agree. We can give only the most important data. The cork consists of cells thickened on the inner side and of flat cells not thickened. The primary bark is only preserved in part. Many of its cells enclose oxalate sacs (according to Lanessan *gros cristan mamelonnes d'oxalate*). The bast is composed of layers of soft bast and fibre groups. The cells of the latter are much compressed, the groups ensheathed by the glandular cells. The medullary rays may contain as many as five cell rows, glands seldom present. The description in the Pharmacographia itself says nothing about bast fibres, on the other hand, it mentions slime cells and also oxalate crystals, whether gland or single crystals, is however not designated. The bark tastes bitter and astringent.

Dymock gives about the same description in the Pharmacographia Indica (I, p. 338). He calls the oxalate crystals, however, expressly "star shaped" as they probably glands. The bark examined by us from the collection spoken of differs again from this. The pieces are about 1 cm. thick covered on the outside with black-gray bark. Where the cork has broken off flat carities appear plainly, (*Conchas* of the cinchora barks). Beneath, the bark is reddish-brown, inside light brown, striate. Fracture short fibrous. The cross section shows obliquely radial and, especially in the inner half, tangential striations. The cork consists of flat, uncompressed cells. It borders toward the inside very immediately upon the bast. Where any of the primary bark still remains, it consists of parenchyma cells with brown contents. Numerous cells contain oxalate crystals and moreover single crystals in preponderance, seldom glands. The bast is plainly stratified. The fibre-bundles extend out over the narrow bast rays. Its cells are much thickened and show plainly the primary membrane. The bundles are ensheathed by septate fibres; their cells contain single crystals. In the soft bast small groups of obliterated sieve tubes are to be found which as far as can be ascertained, have simple, obliquely-placid sieve plates. The medullary rays are about 5 cells in width and 50 high, the cells elongated radially, free from crystals. The cells of the soft bast, on the other hand, contain numerous single crystals. The bark has a bitter, astringent taste. It quickly colors water reddish-brown and contains much tannin green with ferric salts.

The differences between this bast and the first named are not very weighty. They appear to lie especially in the cork and the crystals so that it probably comes from a related plant.

Quite different from all that have been mentioned and very characteristic is the bark which has recently reached us. It consists of pieces reaching 6 cm. in length, 5 cm. in breadth and 2 cm. in thickness which are covered on the outside with gray, fissured cork. Where this is cracked off, the bark shows a brown color with marked violet tinge. On the inside it is dark, red-brown, finely striated. The taste is astringent, aromatic, burning. The watery extract is slightly yellowish and contains abundant tannin turning iron salts blue. In the cross section, the bark shows scant striations and brighter spots. The cork consists of rather long cells much thickened on the side and inner walls. The primary bark shows radially elongated parenchyma cells, some with reddish-brown contents, some with starch in small, round grains. The primary bark contains as a very characteristic feature, groups of radially elongated, pitted stone cells not strongly thickened. These cells are also found in the outer parts of the bast which contain besides, small groups of much thickened, short, curved fibres. Besides the fibres with tapering ends, those occur which are especially short and are bluntly cut off at the ends. They may be designated as "staff-cells" (Stabzellen). The fibre-groups are surrounded by cells with single crystals. The medullary rays reach a width of 3 cell rows and a height of 50 cells; the cells are but little elongated radially. They have brown contents as have the cells of the primary bark. Aside from other differences, this newest bark introduced as *Soymida* is markedly characterized by the violet color and the sclerenchyma groups of the primary bark.

We believe that of the above briefly described barks, that mentioned by Dymock is in greatest probability genuine without, indeed, being able to give other grounds than that Dymock in India would be able most easily to decide concerning the genuineness of the barks described by him.

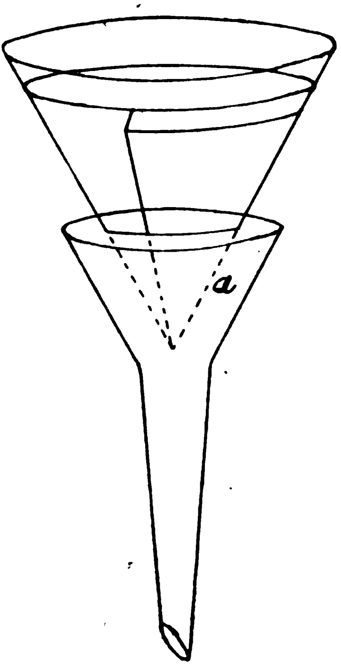
We have discussed this in itself perhaps never conspicuously valuable drug thus more fully than was really the purpose of these lines in order to show how far often the foreign drugs coming to us under a like name differ from each other and how important it is to determine them in the beginning pharmacognostically.

(To be continued.)

Pharmaceutical Technique.

New Funnels.

A new funnel for analytical purposes has been suggested by Rob. Muencke.[*] The apparatus can readily be understood from the accompanying cut without further description. The advantage consists in the fact that that part of the filter with which the precipitate primarily comes in contact does not at all come in contact with the wall of the funnel, but projects free into the lower, wider portion. This increases the rapidity of filtration very greatly. It is claimed that there is no danger as far as tearing of the filter is concerned.

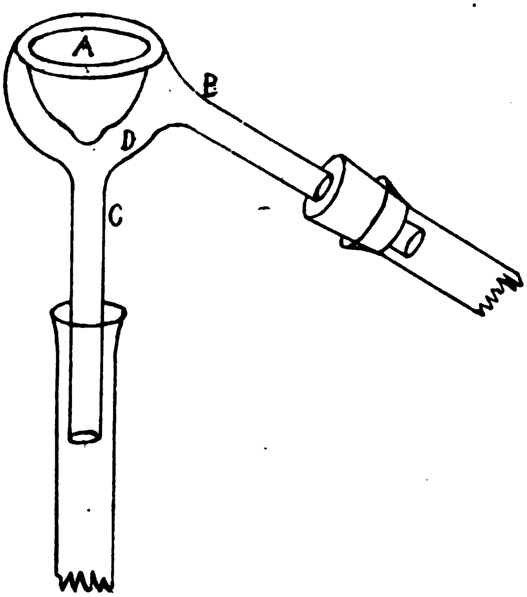


Celluloid filters are recommended by A. H. Edwards[†] for the rapid filtration of larger quantities of liquids. He uses semi-circular celluloid plates with sieve-like perforations. These are bent to assume funnel shape and are suspended from the ring of a retort stand. The extemporized funnel is lined with filter paper. Inasmuch as the filtrate can flow out of the numerous perforations, the rate of filtration is greatly increased.

[Zeitsch. f. anal. Chem. 35, p. 560; *from Pharm. Centrh. 36, p. 94; and †from Chem. News, 71, p. 40.

A New Condenser.

For distillation from a test-tube C. J. Brooks has devised a new condenser represented by the accompanying figure. From the slanting test-tube the vapors rise through tube B into chamber D with the cup shaped cooler A, which contains the cooling medium. The condensed liquid flows through tube C into another test-tube held below.



[Zeitsch. f. anal. Ch. 35, p. 553; from Chem. News, 70, p. 239.]

The Metric System.

The following abstract from Prof. Mendenhall applies equally well to many druggists in particular as to people at large.

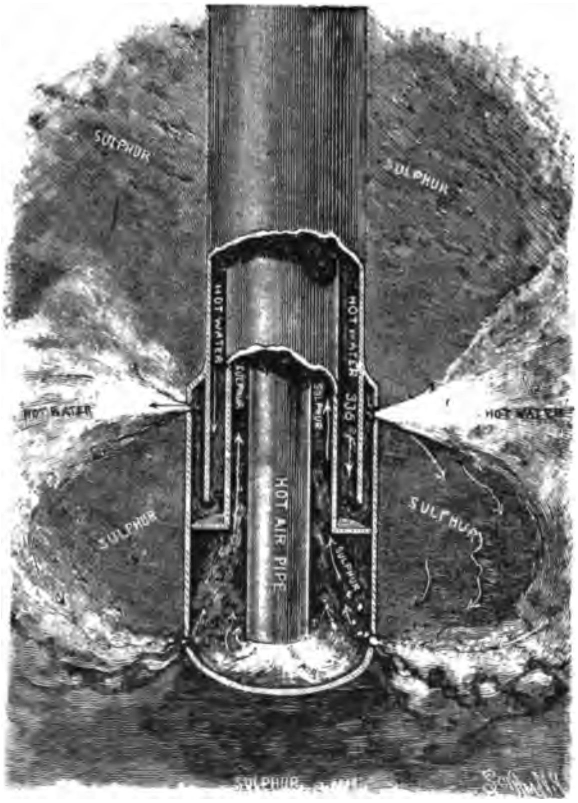
As Mr. Spencer begins by declaring that the advocates of the metric system allege that all opposition to it results from ignorant prejudice, which he very properly declares is far from true, it may be well to say that, in the opinion of the writer, there is relatively little of that sort of thing to contend with in the United States. What is far more dangerous as an obstacle to human progress, and often far more common, is what may be called "intelligent prejudice," meaning thereby an obstinate conservatism which makes people cling to what is or has been, merely because it is or has been, not being willing to take the trouble to do better, because already doing well, all the while knowing that doing better is not only the easier, but is more in harmony with existing conditions. Such conservatism is highly developed among English-speaking people on both sides of the Atlantic, and is likely to turn up in the most unexpected places. It is often a phase of ancestral or national pride, and finds its expression in the feeling that whatever pertains to one's own race or country is, on the whole, better than anything else of its kind. Those who are under its influence are adepts in finding ingenious reasons and excuses in defense of an attitude toward reform which they must know to be founded on neither logic nor fact. These people are numerous among opponents of reform in coinage, weights, and measures, and, as already noted, it is with this class that the most serious difficulty is encountered. "Ignorant prejudice" generally disappears when ignorance disappears, and fortunately in the present instance the system which it is proposed to substitute for that already in use is so extremely simple that it can be learned and understood in a few minutes.

[Appleton's Popular Science Monthly, 49, p. 721.]

Chemistry.

The Louisiana Sulphur Wells.

Some time ago statements appeared in various journals and papers with regard to sulphur mines in Louisiana. and a new mode of mining sulphur buried under from four to five hundred feet of quicksand. J. B. Franckhauser in an illustrated article describes the new method. After briefly reviewing the attempts of 1870 in Calcasien Parish, La., of sinking immense cylinders of steel, and later attempts of freezing the quicksand, he describes somewhat more in detail the present method which appears to contain the elements of success.



The new device originated with a Mr. Herman Frasch, of Cleveland, and is modeled after the mode of operating salt wells. Hot water, at a temperature of 335° F. and under a pressure of from twelve to fifteen atmospheres to prevent it from being converted into steam, is poured into the well. Coming in contact with the sulphur, this is melted, forced back into another chamber of the treble pipe, as is indicated by the accompanying cut, and raised to the surface. The machinery once started, operations proceed until steam is blown off from the top of the pipe, in which case no more sulphur can be melted in the well, at least for the time being.

This may take from several hours to several days. The sulphur thus obtained is, when it reaches the open air, of a dirty, dark brown color. It flows into large shallow vats, is allowed to cool for eight or ten hours, crystallizes meanwhile, and is then sawed into blocks of convenient size. From some of the wells a product containing 99 p. c. pure sulphur was obtained, showing that the new process is likewise one of purification. Inasmuch as iron is acted upon by sulphur and aluminium alone would not be strong enough to support the required pressure, steel pipes coated with a heavy layer of aluminium are used.

[Scientific American 75, p. 280.]

Distribution of Glutamine in Plants.

Inasmuch as asparagine occurs widely distributed in nature, it was assumed by E. Schulze that this might be equally true of its next homologue, glutamine. The extract of the plant is purified by means of basic lead acetate and the amide precipitated with mercuric nitrate. The precipitate is decomposed by means of hydrogen sulphide, the solution neutralized with ammonia and evaporated to crystallization at a temperature of 50—60°. The resulting crystals of the amide were sometimes contaminated with those of asparagine, tyrosine or arginine nitrate. These, however, can be separated according to methods suggested in the original. The presence of glutamine in a considerable number of plants was thus demonstrated. The author is of the opinion that glutamine plays a similar rôle in plant economy as does asparagine, and that the one can replace the other. [Ber. 29, p. 1884.]

Arsenate of Lead, a New Insecticide.

This substance has been recommended as a substitute for Paris green in spraying mixtures used for the destruction of "biting" insects, such as the apple worm (Codling Moth) and the Plum Curculio. Being insoluble in water, and reported as non-injurious to foliage, it is held that it may with safety be employed in larger amounts than those given in the formulæ containing Paris green; at the same time it is said that this compound is equally as efficacious in the extermination of insect foes as the latter.

The compound can be prepared according to the following equation:—

$$2Na_2HAsO_4.7H_2O + 3Pb(C_2H_3O_2)_2 = Pb_3(AsO_4)_2$$
$$+ 4NaC_2H_3O_2 + 2HC_2H_3O_2 + 14H_2O.$$

To prepare 50 gals. of the mixture at the rate of 1 ℔ of lead arsenate to 200 gals. water, 3 oz. of arsenate of soda and 4¾ oz. of lead acetate are dissolved each in a quart of water. Both solutions are poured into a barrel containing about 45 gals. of water. The mixture is well stirred and finally made up to 50 gals. This formula provides for the presence of a slight excess of lead acetate in solution. If arsenate of soda were in excess, injury would probably result to the foliage. The compound is precipitated from very dilute solution in order to secure a fine precipitate which will remain longer in suspension.

[Report Exp. Farms of Canada for 1895, p. 220.]

Action of Ferric Chloride on Gold.

P. C. McIlhiney has made a number of experiments which lead him to the conclusion that hydrochloric acid in presence of air is without action on metallic gold, that ferric chloride is without action on gold unless oxygen is present, but that ferric chloride acts as a very efficient carrier of chlorine in the presence of hydrochloric acid and oxygen. This fact helps to account for the solubility of gold in mine waters and in other waters containing iron, acid and common salt.

[Am. Journ. of Sc. 152, p. 293.]

Botany and Pharmacognosy.

Saffron in Spain.

The British consul at Malaga is informed that the price of saffron seed varies in proportion to the price of saffron itself. The ground is lightly prepared in August to a depth of 15 cm., the seed planted about 8 cm. deep, in rows 20 ccm. apart, with 1 or 2 cm. between the seeds. There is no fruit until the second year, and after the sixth year it is customary to renew the plantation. Gentle hoeing is necessary in summer, and the soil must be loosened with a special tool before the plants are moved at the end of September. Soil in which the plant grows for the first time gives the best result and the richer the soil, the better the return. The flower is picked during the latter half of the month of October, and the product, after drying on low sieves over a slow fire, is divided into nine classes, the prices of which vary according to the quantity of each class that the crop yields and the demand for the same.

[Pharm. Journ. 57, p. 64.]

The Kosotree in Usambra.

Flores Koso, the well-known anthelmintic of the drug-store, is derived from a rosaceous tree: *Hagenia abysinnica* Willd (also known as *Brayera anthelmintica* Knuth). For a long time this tree was known to grow only in Abysinnia, from which country it derives its species name. Later it was found also on the Kilimandscharo, where it grew at an altitude of from 1400 to 2800 meters. Recently it has also been found by Dr. **Buchwald** near the source of the Kwasinde in Usambra. It grows along the boarders of woods in clearings at a height of 1700 m. The possibility of exporting the drug from the German colony is suggested.

[Die Natur, 1896, p. 423; from Notizbl. d. kgl. bot. Gart. u. Mus. zu Berlin, No. 5.]

Adulteration of "Sandmandelkleie".

G. Marpmann has investigated two specimens of Sandmandelkleie from widely differing sources with interesting results. One specimen contained 62 percent ash and 30 percent organic matter. The ash consisted for the most part of pure diatomaceous earth of the type characteristic for the "Lüneburger Heide." The organic substance was mainly wheat flour with a small content of Mandelkuchenmehl and was perfumed with cumarin. The second specimen differed mainly in the source of the diatomaceous earth, this coming from the region of the Danube. The ash in this case made up only about 30 percent.

The genuine Sandmandelkleie consists of about 10 percent of finest sea sand which has been treated with hydrochloric acid to remove fragments of shell, etc., and of pure flour or Mandelkuchen. This preparation cannot be injurious to the most delicate skin. The diatomaceous earth, on the other hand, consists in great part of slender, pointed and often angular bodies which cannot but be injurious when rubbed into the epidermis.

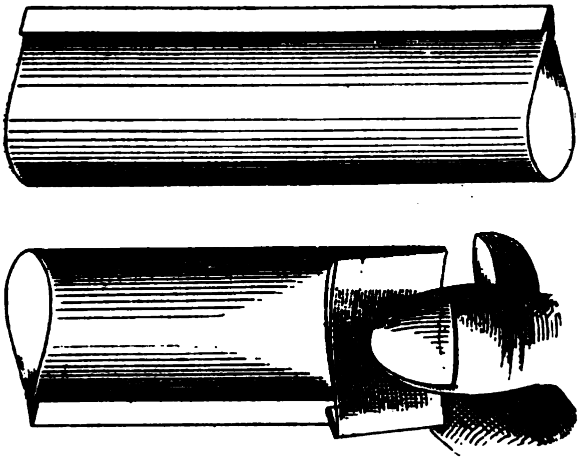
[It appears that the use of diatomaceous earth in this preparation is usual, since in the Real-Encyclopædie der Pharmacie 9, p. 36, both diatomaceous earth and sea sand are mentioned in this connection.]

[Zeitschr. f. angewandte Mikroscopie, 2, p. 10.]

Practical Pharmacy.

Oval Folded Powder-Papers.

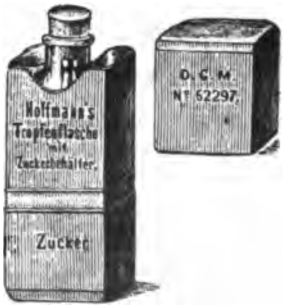
A new form of ready folded powder-papers (Falzcapseln) has recently been patented by E. Siegemund, Hirschberg in Schlesien, Ger., which does away with the objectionable blowing into generally practiced in opening the ordinary folded powder-papers. As seen in the accompanying cut, these papers differ from similar ones in being folded on one side only, and thus being kept open by the elasticity of the paper itself.



A Pocket Medicine Case.

A very convenient pocket case for carrying small quantities of medicine has recently been patented and placed upon the market by Georg Hoffmann, Apotheke z. Storch, Dresden, Pillnitzerstrasse. The case, of which the accompanying cut gives a good idea, is made of nickelled tin, and is of such a size as to be easily carried in the pocket.

For carrying medicines intended for internal administration, of which only small doses are to be given, one half of the case is taken up by a small bottle, while in the other are lumps of sugar with which the medicine is to be taken. For carrying tooth-ache drops, Turlington's balsam etc., the sugar is replaced by absorbent cotton or by cotton and strips of adhesive plaster.


Hoffmann's Tropfenflasche mit Zuckerbehälter.
D.C.M. Nr 62297.
Zucker

Rose-Geraniol.

It is generally known that in Turkey the yield of oil obtained from rose petals is increased by sprinkling the petals with palmarosa oil before distillation. This adulteration was ingenious, for as Schimmel & Co. have shown geraniol is quantitatively the most important constituent of both palmarosa and rose oils. This firm has recently introduced under the above name a product obtained by the distillation of rose petals with pure geraniol. The introduction of those constituents which impart the peculiar flavor to palmarosa oil are thus not given to the so-called rose-geraniol, but this resembles the true rose oil much more than the Turkish product. Another difference is that the rose-geraniol is not sold as rose oil, but as a distinctively artificial product.

At first a product was obtained by distilling 500 parts of rose petals with 1 p. of pure geraniol. This according to a circular was termed "Rose-Geraniol, Saturated." The product obtained by distilling 1000 p. are petals with 1 p. geraniol according to the same circular is termed "Rose-Geraniol, Extra Saturated." According to the latest report this "tausendfaches Rosen-Geraniol" has a sp. gr. of 0.876 at 25° and congeals at + 13.5°. The "zweitausendfünfhundertfaches Rosen-Geraniol," obtained by distilling 1 p. of geraniol with 2500 p. fresh roses, has a sp. gr. of 0.872 at 25° and congeals at + 17.5°. This seems to verify the claim that the new article, which is to become a competitor of Turkish oil, is "scarcely distinguishable from pure otto of roses." [Inasmuch as both sp. gr. and congealing point of the latter product fall within the requirements of the U. S. P. it is to be hoped that there still remains some method by means of which the rose-geraniol can be distinguished from the genuine oil after it has passed through the hands of several intermediaries.]

[Schimmel & Co. Bericht, Oct., 1896, p. 66.]

Literary.

Books and Pamphlets Received.

Bibliographisches Institut—Leipzig. Meyer's Conversations-Lexicon. Ein Nachschlagewerk des Allgemeinen Wissens. Fünfte, gänzlich neubearbeitete Auflage. Mit circa 10,000 Textabbildungen, 1000 Bildertafeln, Karten und Plänen. 13. Band. Nordseekanal bis Politesse. 1060 Seiten. 1896.

——Geschichte der ältesten Litteratur von den ältesten Zeiten bis zur Gegenwart. Von Prof. Dr. Richard Wuelkner. Ein Bd., pp. 632. Mit zahlreichen Illustrationen. 1896. $5.00.

Lea Brothers & Co. — Philadelphia. The Students' Dictionary of Medicine and the Allied Sciences. Comprising the pronunciation, derivation and full explanation of medical terms, together with much collateral descriptive matter, numerous tables, etc. With appendix. By Alexander Duane, M. D. One vol., pp. VIII, 679.

——Ptomaïns, Leucomaïns, Toxins and Anitoxins: or, The chemical factors in the causation of disease. By Victor C. Vaughan, Ph. D., M. D., and Frederick G. Novy, Sc. D., M. D. Third edition, revised and enlarged. One vol., pp. XII, 604.

Julius Springer — Berlin. Vierteljahresjahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel. Unter Mitwirkung von Fachgenossen redigirt von Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Zweites Heft. pp. 161—310. 1896.

C. W. Kreidel's Verlag—Wiesbaden. Naturwissenschaftliche Einführung in die Bakteriologie. Von Dr. Ferdinand Hueppe, Professor der Hygiene an der deutschen Universität zu Prag. Ein Bd., pp. VIII, 268. Mit 28 Holzschnitten im Texte. 1896. M. 6.00.

S. J. Wheeler—Chicago. Medical Chemistry. Including the outlines of organic and physiological chemistry. Based in part upon Riche's Manual de Chemie. By C. Gilbert Wheeler, formerly Professor of chemistry in the University of Chicago and in the Chicago Medical College. Fifth edition. One vol., pp. 424. 1896.

Georgia Agr. Exp. Station—Atlanta. Commercial Fertilizers and Chemicals, inspected, analyzed and admitted for sale in the State of Georgia up to Sept. 1st, 1896, and other information in regard to fertilizers. By Dr. George F. Payne, State Chemist. Bulletin No. 32, pp. 132. 1896.

Colonial Museum—Haarlem, Holland. Bulletin, July, 1896. Inhoud: Verslag over het jaar 1895, met Bijlagen. Pamphlet, pp. 64. 1896.

Author—The Achievements of Physical Chemistry. Address by Vice-President W. A. Noyes, before the Section of Chemistry, Am. Assoc. for the Adv. of Sc. at the Buffalo Meeting, Aug., 1896. From the Proc. of the A. A. A. S., vol. 45. Pamphlet, pp. 17.

Schimmel & Co.—Leipzig. Bericht, October, 1896. Pamphlet, pp. 110, with a map.

Authors—Ueber Borsäure und ihre Salze. Von Louis Kohlenberg und Oswald Schreiner. Separat-Abdr. aus Zeitsch. f. phys. Chem. 20, No. 4. Pamphlet, pp. 22. 1896.

Author — Presidential Address at the thirty-third annual meeting of the British Pharmaceutical Conference at Liverpool. By William Martindale. Pamphlet, pp. 15. London, 1896.

Author—Liverpool Revisited. An illustrated guide to the proceedings of the British Pharmaceutical Conference at Liverpool. Reprinted, with additions, from the Pharmaceutical Journal. Pamphlet, pp. 48. 1896.

Schering and Glatz—New York. 1) Creosote Carbonate in the treatment of pulmonary tuberculosis. By Dr. W. H. Dukeman. 2) A contribution to the study of the therapeutic employment of creosotal. By Dr. S. Reiner. 3) Medicated Kefir. 4) Guaiacol Carbonate as a substitute for creosote in phthisis. By Dr. M. Green. Reprints from medical journals. Pamphlet, pp. 15. 1896.

Reviews.

The Student's Dictionary of Medicine and Allied Sciences. Comprising the pronounciation, derivation, and full explanation of medical terms, together with much collateral descriptive matter, numerous tables, etc. With appendix. By Dr. Alexander Duane, Assist. Surgeon to the N. Y. Ophthalmic and Aural Institute; Reviser of medical terms for Webster's International Dictionary. Lea Brothers & Co., Philadelphia. One vol., pp. VIII, 679. $3.00. 1896.

The object of the author has been "to give sufficient but succinct information concerning every word that the student or physician will be likely to meet with in the course of his professional reading." In order not to render the work too voluminous for the means of the average student, obsolete words have been carefully omitted. "Practical utility rather than historical tradition has controlled the selection of matter."

That there appears to be a demand for such a work seems to be indicated by the call for a new edition. The publishers have recently accompanied the announcement of this new edition by calling attention to the reduction in price which was made possible.

The work is planned on the alphabetical arrangement of a series of major titles or primes, each beginning a separate paragraph and printed in heavy type; and of a series of subordinate headings placed in the body of the paragraph. This arrangement has enabled the crowding of a great amount of matter into a comparatively small space. Yet the pages are by no means overloaded and the judicious use of heavy type makes orientation quite easy. The numerous tables add largely to the value of the work. All told the volume contains a remarkable amount of information for its size and certainly ought to be within the means of every student. *E. K.*

Meyer's Conversations-Lexicon. Ein Nachschlagewerk des allgemeinen Wissens. Fünfte, gänzlich neubearbeitete Auflage. Mit circa 10,000 Textabbildungen, 1,000 Bildertafeln, Karten und Plänen. 13ter Band. (Nordsee Kanal bis Politesse). 1060 Seiten. Verlag des Bibliographischen Institutes. Leipzig und Wien. 1896.

Der dreizehnte Band dieser vorzüglichen Encyclopaedie ist textlich, wie durch die grosse Anzahl von Farbendruck und anderen Abbildungen und Karten von besonderem Interesse und grosser Schönheit. Der Band ist auf allen Wissensgebieten reich an grösseren Artikeln, besonders auf geographischen und naturwissenschaftlichen. Von letzteren mögen folgende erwähnt werden: Orchideen, Orientalische Fauna, Palmen, Pferd, Pflanzen, Pflanzenverbreitung, Pflanzenkrankheiten, Pflanzenornamente, Pflanzenzelle, Phosphor, Pilze, Planetensystem, Polarisation, Polarlichter. Grössere Artikel technischer Art sind: Oefen, Panzerschiffe, Papier, Photographie, Photometrie. Für unsere Leser sind auch von speciellem Interesse die Artikel: Patent, Patentrechte, Patentgesetze, Pharmacognosie, Pharmacie, Pharmacologie, Pharmacopöen, Physiologie. Der Artikel über Pharmacie ist, wenn auch sehr knapp, doch gut geschrieben. Nur auf dem Gebiete der allgemeinen und der periodischen Fachliteratur ist der Artikel unzureichend und ohne genügende Kenntniss der letzteren verfasst.

Das Meyer'sche Lexicon hat sich auf seinem Felde in deutscher Sprache bekanntlich den Weltmarkt längst erobert. Es ist von Auflage zu Auflage an Umfang gewachsen und inerhaltlich vollendeter geworden. Der erstaunliche Fortschritt der Kunsttechnik allein wird in überraschender Weise zur Anschauung gebracht, wenn man die Bände der älteren Auflagen dieses Conversations-Lexicons mit denen der fünften Auflage des Jahres 1896 vergleicht. Dies gilt auch für den gesammten textlichen und vor allem für den illustrativen Inhalt des Werkes, welches in dieser Beziehung wohl unerreicht darsteht

Das prompte Erscheinen des Lexicons führt dasselbe seiner baldigen Vollendung schnell entgegen. *Fr. H.*

Geschichte der englischen Litteratur von den ältesten Zeiten bis zur Gegenwart. Von Prof. Dr. Richard Wülker. (*History of English Literature from ancient times until the present.*) One large vol., pp. 632, with 25 chromo plates and engravings, 11 facsimile prints and 162 illustrations. Published by the Bibliographisches Institut, Leipzig and Wien. 1896. Price, half leather, $5.00.

This masterly written and magnificently illustrated work is the first treatise in either the German or the English languages, which may well claim to be a complete scientific history of English literature. None of its many predecessors fulfills so well the requirements both of science and of modern literary taste. The advantage of the book is that it thoroughly represents the entire development of English literature; this is evident from the fact that the book begins with the times preceding the arrival of the Anglo-Saxons, giving even a short sketch of Celtic literature. Anglo-Saxon literature is treated just as fully as English literature proper. This had to be done in order to demonstrate how early some of the characteristics of the British mind became prominent and how they were developed in the course of centuries. Among these traits are the predelections of the English people for the drama and the novel and their inclination towards serious religious themes and poetry descriptive of nature. Nor does the book fail to prove that humor, which evidently is not yet extinct in England, already appeared in early times—as for instance in Chaucer's works, to which much space has been devoted.

A great merit of the author of this standard work lies in the precise and lucid representation of the vast material that had to be gone over; this advantage combined with a graceful style makes it a work that is not only strictly scientific but at the same time interesting and attractive to an educated public. The author has well succeeded in giving the book as much as is compatible with its strictly scientific aim a popular character. As most readers cannot well be familiar with all the older literature mentioned in the book, Prof. Wülker has with good taste and discrimination added a sketch of the contents of the more important works and has selected a large number of characteristic quotations well translated into German.

The popular and entertaining character of the work has largely been increased by an abundance of splendid illustrations, largely true works of art, which have not been copied from preceeding literature but are exclusively reproductions from earlier or from contemporaneous pictures, drawings, documents etc. Among the most interesting and valuable of these excellent reproductions are: the coronation of King Henry IV of England, the bust of William Skakespeare in Trinity church in Stradford, a company in Tunbridge Wells including Dr. Johnson, Cibbar, Garrick, Pitt, Richardson and others, the fall of the evil angels (from an Anglo-Saxon Manuscript), places where Shakespeare has lived, and many fac-simile reproductions of the most famous poets of England. All these colored plates and other illustrations are masterpieces of the highest types of modern reproductive art.

Prof. Wülker's History of English Literature ranks foremost among this class of books of our time; it will command a place in every well appointed public and private library. Its comparatively low price makes it readily accessible to every family and every student and friend of literature. The book is a great credit to its author and publishers and is specially suited for, and of paramount and enduring value as a Christmas or New Years present. *Fr. H.*

Ptomaïns, Lencomaïns, Toxins and Antitoxins: or The chemical factors in the causation of disease. By Dr. V. C. Vaughan and Dr Fr. G. Novy, Professor and Junior Professor, respectively, of Hygiene and Physiological Chemistry in the University of Michigan. Third edition, revised and enlarged. One vol., pp. XII, 604. Lea Brothers & Co., Philadelphia. 1896.

The fact that the first edition published in 1888 was succeeded by a second in 1891 and a third in April of this year may be considered complimentary to the authors and such it is. It, however, implies much more. Not only was there a need for a book of this kind, but the growth of the book indicates that the revisions came none too often.

The bacteriological and chemical explanation of disease is possibly doing more than any thing else to take medicine from its old empirical basis, on which it still rests to no small extent, and make it truely scientific in a modern sense of this term. A chemical explanation of the animal functions, both normal and pathologic, is not new in itself, yet our knowledge of the chemistry of even the normal functions of the human body must be meagre. This condition must last as long as the chemistry of the so-called albuminoids and related substances is shrouded largely in darkness. This explains why the physiological chemist gropes almost in utter darkness when he tries to explain chemically the processes that take place during the formation of toxins, antitoxins, and their action on each other both in the testtube and in the human organism. As long as our chemical knowledge of these substances is itself almost *nil* nothing else can be expected.

It was quite different with some of the so-called ptomaïns and lencomaïns. It was not a matter of very great difficulty to identify some of the former class with the polymethylene diamines and with derivatives of trimethylamine. A fair knowledge of the chemistry of these bases had prepared the way for a better understanding of these substances as soon as their basic character had been recognized and methods for their isolation had been devised. The result is that we are largely independent of herring brine and decomposed corpses in the preparation of these substances, while the commercial toxins and antitoxins are comperable to our crude galenical preparations, most of which cannot be assayed chemically or even identified by chemical means.

The terms ptomaïns, leucomaïns etc. are not, strictly speaking, chemical terms. They have no place in chemical classificatian except in sorting the rubbish of the chemical lumber-chambers. Like the term alkaloids, terpenes etc. they loose their chemical significance in the same degree as our knowledge of the chemistry of these substances advances.

Our chemical lumber-chambers may never be thoroughly cleaned and thus be abandoned. Excellent work along this line, however, has been done during tne last decade and those who are busy in this work deserve the thanks of humanity fully as much as those who are active in fields that have been longer and better cultivated. The work before us has been one of the most prominent, certainly in American literature, along this line. The coupling of the names of Vaughan and Novy have almost become household words with the physiological chemist, the bacteriologist and the physician of this country. To enter into the detailed discussion of the book would, therefore, be entirely superfluous. The historic character is maintained in the third edition, the bibliography is brought up to date as well as the contents of the body of the book. This edition, like its precursors, will no doubt go forth to do good missionary work: to spread the study of disease from a modern scientific stand point. *E. K.*

Vierteljahresbericht über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Mit der Redaction beauftragt: Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Zweites Heft. Verlag von Julius Springer. 1896.

This quarterly which is edited by four specialists aided by fifteen more makes its appearance with regularity and keeps abreast with the times. Its regular and prompt appearance makes it an invaluable aid to the food chemist who can neither afford to wait for yearbooks nor keep a host of chemical journals. Even to those who have access to most of the important journals a quarterly classification of the literature is of greatest importance. That the work is well done goes almost without saying. *E. K.*

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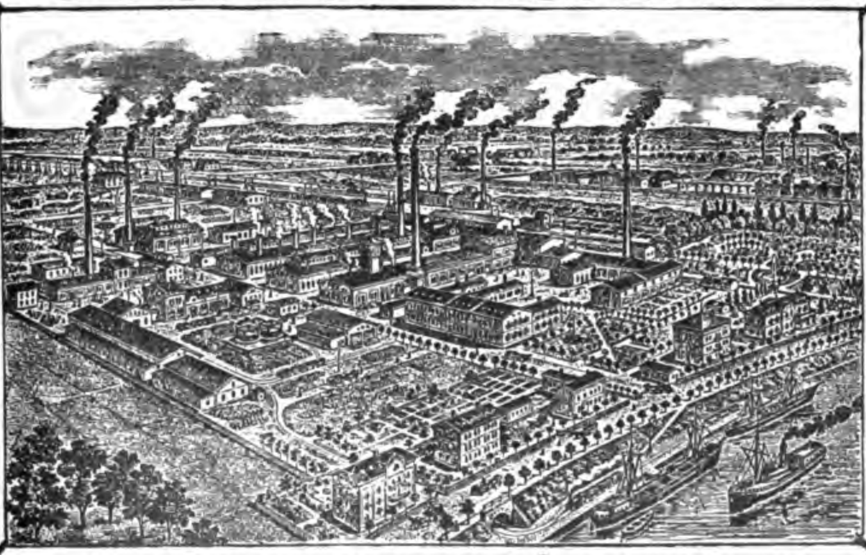

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SUPPLEMENT, DECEMBER 1896.

Universities and Colleges.

Buitenzorg.

The government of Dutch India has allowed M. 24,000 for the erection of a research laboratory in the botanical garden at Buitenzorg near Batavia.

Paris School of Pharmacy.

The faculty for the 1896—97 session consists of M. Riche, mineral chemistry, M. Planchon, materia medica, |M. Milne Edwards, zoology, M. Moissan, toxicology, and M. Jungfleisch, organic chemistry.

California College of Pharmacy.

The twenty-third annual commencement exercises of the departement of Pharmacy of the University of California were held on the twelfth of last month at Native Sons' Hall, San Francisco.

University of Strassburg.

The Imperial Friedrich Wilhelms University will celebrate the twenty-fifth year of its reorganization as a German University on May first of next year. Preparations for an elaborate celebration are being made.

The Imperial Institute Research Laboratory.

This laboratory was formally inaugurated on Monday evening, Nov. 9, by Mr. W. R. Dunstan, the Director of the Scientific and Technical Department of the Institute. The chemical staff includes most of the former students in the Phar. Society Research Laboratory, who have accompanied their chief to his new quarters. Natural products from India and the Colonies are being investigated with a view to their commercial utilization.

Massachusetts College of Pharmacy.

The year at this school has opened auspiciously. Several have applied for the new degree, Ph. C. which is now offered. It is intended to make this degree correspond in character of requirements to the same as given by the best university schools. No store experience is required, but candidates must spend their entire time during two years at the school.

The pharmaceutical laboratory has been enlarged during the summer, thirty-two new desks having been added. Laboratory work is now required in the general chemistry course. This makes laboratory work compulsory in connection with every course, during both junior and senior years.

The recent death of Professor Markoe will cause no further change in the Faculty, this contingency having been provided for last spring. The position of Professor of Industrial Pharmacy, to which he was elected, will remain vacant. Professor Scoville succeeds him in the chair of Theory and Practice of Pharmacy, and E. H. La Pierre Ph. G. is the newly-appointed Professor of Applied Pharmacy. During the coming winter an effort is to be made to prepare prospective graduates for an active part in the affairs of pharmacy after graduation, by talks upon topics which may inform them in regard to present conditions, tendencies, and efforts of pharmacy and pharmacists throughout the country.

History.

Justus v. Liebig.

Number eight of Gaea contains a continuation of the memoirs of Voigt referred to on p. 26. of the October Supplement. There are several more references to Liebig, which throw interesting side lights on the life of this famous chemist. Liebig's attitude toward a proprietor of a dye-works should be of considerable value to pharmacists who are interested in the live topic of practical experience before or after college education. "So erzählt er (Vogt) wie eines Tages ein grosser, starker Mann mit seinem Sohne zu Liebig kam. Es war einer der Baumwollprinzen aus Mülhausen, und da er eine laut hallende Stimme besass, so hörte man jedes Wort. Er bitte Herrn Liebig, sagte er, seinen Sohn als Lehrling einzustellen. Derselbe solle in der Fabrik die Färberei übernehmen; ein anderer Sohn stehe an der Spitze der Weberei, ein anderer dirigiere die Spinnerei. Er bitte also Herrn Liebig, seinen Sohn in den Farben zu unterrichten. "Ich bin kein Färber," antwortete Liebig, "ich kann Ihren Sohn nicht brauchen! Nehmen Sie ihn nur wieder mit und thun Sie ihn in eine Färberei!" Der Mann legte sich aufs Bitten; Liebig wiederholte heftig seine Weigerung. Als der Mann zu schluchzen anfing, hörten wir endlich, wie Liebig nachgab. "Ich dirigiere ein chemisches Laboratorium," sagte er, "und keine Färberei. Aber ich will Ihnen etwas sagen. Wenn Sie Ihren Jungen hier lassen wollen, so will ich, wenn er anders Anlagen hat, einen tüchtigen Chemiker aus ihm machen. Aber er muss zwei Jahre bleiben und sich nur mit Chemie und nicht mit Farben beschäftigen. Davon soll er gar nichts hören. Aber wenn er dann nach Hause kommt, so wird er in vierzehn Tagen mehr von Farben verstehen als alle Ihre Färbemeister zusammen genommen. Sie verstehen?" — Der Mann verstand und hatte es später nicht zu bereuen."

On the other hand Liebig did not lay much stress on the traditional requirements of a gymnasium education preliminary to university work. As a consequence he was in perpetual warfare with the "Universitätszöpfen" who considered Liebig a "verderbliches, schädliches Element, dem man um jeden Preis Halt gebieten müsse." After Liebig's laboratory had become world famous he had free play.

Two other abstracts from Voigt's memoirs may be quoted as of special interest. "Wir wurden bald zu den Arbeiten unseres Meisters selbst zugezogen, während er zugleich darauf drang, dass wir eigene Arbeiten machen sollten. 'Nichts eifert die jungen Leute mehr an,' sagte er, 'als ihren Namen gedruckt zu sehen. Die Franzosen haben ein ganz verkehrtes System. Alles, was in einem Laboratorium in Paris oder in der Provinz gemacht wird, muss unter dem Namen des Professors in die Welt gehen. Das entmuthigt die jungen Leute, abgesehen davon, dass der Professor oft für Dummheiten einstehen muss, die ihm doch nicht zur Last fallen. Dieser Dumas, er hat Dinge vertreten müssen, die seine Assistenten verschuldet hatten. Die Leute, die bei mir arbeiten, publizieren unter ihrem Namen, wenn ich ihnen auch geholfen habe. Wenn es etwas Gutes ist, so schreibt man mir doch einen Theil davon zu und die Fehler brauche ich nicht zu vertreten. Sie verstehen?'"

"Wenn Liebig in einer Arbeit war, mochte es nun eine Untersuchung oder eine schriftliche Abhandlung sein, so kannte er nicht Ruhe noch Rast. 'Er schreibt die Abhandlungen', sagte mir einmal einer seiner Kritiker, 'wenn der Tiegel mit den Resultaten noch im Feuer steht und wenn er sich die Finger beim Herausheben verbrannt hat, schickt er das Geschriebene in die Druckerei!' Aber trotz seiner Hast war er ein ausserordentlich geschickter und sorgfältiger Experimentator im Laboratorium. Freilich wurde dieses förmlich durcheinander gewirbelt auf der Höhe der Aktion und im Feuer des Eifers wurde niemand geschont. Er erscheint, ein Glasfläschchen mit eingeriebenem Stöpsel in der Hand. 'Machen Sie einmal den Arm bloss,' sagte er zu mir. Ich thue es; er schüttelt das Fläschchen und tupft mir mit dem Stöpsel auf den Arm. Ich fühle einen brennenden Schmerz und tauche augenblicklich den Arm in einen Kübel mit Wasser. 'Nicht wahr, es brennt?' sagte er. 'Sie sehen. Ich habe eben wasserfreie Ameisensäure dargestellt; ein Tröpflein ist mir auf die Backe gespritzt und hat gleich ein Bläschen gemacht. Sie sehen? Geben Sie auch Ihren Arm, Demarçay!' Einige halten den Arm hin, Ettling weigert sich entschieden. 'Sie haben nicht unrecht — ich glaube, die Herren werden morgen alle dick geschwollene Arme haben. Diese wasserfreie Ameisensäure, sie ist ein Ätzmittel! Alle wasserfreien Säuren müssen Ätzmittel sein, weil sie den Geweben augenblicklich Wasser entziehen!' — Ich hatte die stärkste Portion bekommen, musste einige Tage den Arm in der Binde tragen und noch heute steht auf meinem Arme die kreisrunde, weisse Narbe als Erinnerung an die Entdeckung der wasserfreien Ameisensäure."

A Potato Tercentenary.

The holding of a potato tercentenary in England this year is now being agitated. As one of our foreign exchanges states: "In 1596 the first potato was planted in England, in Holborn, about the time that Sir Walter Raleigh was planting the first Irish potato at Youghal near Cork. For two centuries the potato continued as a botanical curiosity. When first eaten it was a delicacy, sometimes roasted and steeped in sack, or baked with marrow and spices or preserved and candied. When Parmentier developed the plant in France, Louis XVI and Marie Antoinette wore the flowers as ornaments. Frederick the Great had to force the Pomeranian farmer to plant potatoes by the fear of the soldiers. It was the famine of 1771—72 in Germany that first demonstrated the value of the 'tubers'. The fact is that it has been only within the past century that the potato has risen in its prominence as an esculent, even in Ireland, the land of the murphies'."

The introduction of the potato into England was directly due to Sir Walter Raleigh, whose Virginia expedition ships brought back some of the tubers in 1586; but to the Spaniards is really to be credited the discovery and European introduction of the new article. It was undoubtedly through the Spaniards that the potato was brought to Virginia. There is no proof that the North American Indians cultivated the potato before the Spanish Conquest. It grows wild today, as then in Peru and Chile. The Spaniards carried the tuber to Spain long before the Raleigh incident; and from Spain it was taken to Italy, from which country it was introduced into Flanders, in 1859. The date of the proposed English tercentenary will therefore be about ten years too late. The very name of potato comes from the Spanish "batata".

But the potato has of late years fallen into something of its early contempt. The scientists of the cuisine, such as Dr. Cyrus Edson and Mrs. Rorer, are warning eaters not to depend too much upon the potato for nutriment. Leguminous food should largely supplement its use. Furthermore, overindulgence in a potato diet conduces to dyspepsia; and herein may be revealed the origin of the prevalence of that distressing complaint in America. The potato is not a root, as so many are accustomed to style it; it is an underground stem, swollen up by accumulated starch stored up for future use. Its exact place in the dietary has not yet been settled. It is a curious thing to note, too, that to the same genus (Solanum) belongs tobacco, which was given to Europe at about the same time as the potato; and the tomato and egg plant are its follow esculents.

[Scientific American, Vol. LXXV, No. 17; from Southern Planter.]

In Memoriam.

Henry Trimen.

Dr. Trimen, who died in October at Peradeniga, Ceylon, in his fifty-third year, was late Director of the Royal Botanic Gardens, Ceylon. He is best known to pharmacists, as joint author with Bentley of "Medicinal Plants", a most valuable work, prepared while he was senior assistant in the botanical department of the British Museum. He was also for many years editor of the Journal of Botany, one of the authors of Trimen and Dyer's "Flora of Middlesex", and of late years had been engaged in writing his "Handbook to the Flora of Ceylon". Three volumes of this have been published, and the fourth will complete the work.

Eugen Sell.

Professor Eugen Sell of the University of Berlin and member of the Imperial Sanitary Station died Oct. 13 at the age of fifty-five years. He was born April 5, 1842, in Bonn, studied chemistry and became docent in chemistry at the University of Berlin in 1870, holding at the same time a position at the Gewerbeakademie. In his earlier years, Sell devoted his time primarily to theoretical, organic and analytical chemistry. Later, however, and especially after he became member of the Imperial Health Station, he applied his knowledge and experience in the direction of hygiene and the chemistry of food-stuffs. He was instrumental in securing favorable legislation for the special training and examination of food-chemists, and since 1894 was a member of the examining commission of "Nahrungsmittelchemiker" at the University of Berlin. Of his literary productions special attention should be called to his contributions in the Arbeiten des kaiserl. Gesundheitsamtes and in the Vierteljahresschrift über die Fortschritte der Chemie der Nahrungs- und Genussmittel.

Ferd. v. Mueller.

The famous botanist Baron Ferdinand von Mueller, Director of the Botanical Garden of Melbourne, Australia, died Oct. 9. He was born June 30, 1825 in Rostock, studied 1846—47 in Kiel and emigrated with two sisters to Australia. After a number of excursions Mueller was appointed government botanist for Victoria and in 1855 accompanied Gregory on his geodetic expedition to West Australia. Upon his return he conducted the laying out and assumed directorship of the botanical garden in Melbourne. When the University of Melbourne was established he became a member of its faculty. Mueller was especially active in systematic botany. He named not less than 2000 plants. He also did much for the zoologic and geographic exploration of Australia. He contributed many specimens to European and American museums, but on account of his personal friendship with Director v. Krauss was especially liberal to the museum at Stuttgart. His generosity was rewarded by being knighted in 1870. Science has honored him in various ways, most numerously, however, by naming many species of plants after him.

Alfred H. Mason.

On the morning of the second of November Mr. Mason died of pneumonia, having been ill but a very short time, his illness being unknown to most of his friends.

Alfred Henry Mason was born at Newcastle-Under-Lyme, England, fifty-three years ago. He began his pharmaceutical career early and worked his way up by hard work. He came to Montreal in 1884, but returned to England in 1888 to represent the firm of Seabury & Johnson. During this short period of four years he thoroughly identified himself with American pharmacy in various capacities. In England also he soon became reidentified with association and educational affairs. Being made secretary of the firm of Seabury & Johnson in 1892 he returned to this country the following year. During the short period remaining he was unceasingly active. He was one of the organizers of the N. Y. Section of the Society of Chemical Industry and served as its first chairman. He succeeded Mr. Hegeman as secretary of the New York College of Pharmacy and also served as editor of the Alumni Journal.

Eugen Baumann.

The Professor of Medical Chemistry at the Univerity of Freiburg died on the third of last month. Eugen Baumann was born Sept. 12th, 1846 in Cannstadt, where his father was apothecary. Eugen attended the Latin School of Cannstadt and later the Obergymnasium at Stuttgart. Having completed his preparatory studies he matriculated at the Polytechnicum in Stuttgart. At the same time, following the wishes of his father, he familiarized himself with pharmacy and passed the assistants examination. In 1870 while in Tuebingen to prepare himself for the apothecaries career he met Prof. Hoppe-Seyler, who influenced him to adopt the scientific career by offering him the position of assistant. Here he received his doctor's degree in 1872. When Hoppe-Seyler was called to Strassburg, Baumann followed as his assistant and became Privatdocent in 1876. When Emil du Bois-Raymond established his large physiologic institute in Berlin, Baumann was offered a position in physiological chemistry. In 1882 he was made extra-ordinary professor of the medical faculty. The following year he was offered a full professorship in medical chemistry in Freiburg, where he remained to his end.

The scientific career of Baumann covers almost a quarter of a century. Much of his work was important to pharmacy as well as to medicine. He became more particularly known to chemists through his work on paired sulphuric acids and the physiological conslusions drawn therefrom. More popularly his name is connected with the introduction into medicine of sulfonal and trional, and with the determination of the presence of iodine in the thyroid gland.

Though lost to pharmacy in a direct sense, the former apothecary reflected credit upon the calling of his father as well as upon the little university of Tuebingen from which so many physiological chemists have emenated.

Bibliography.

Les Fils D'Émile Deysolle announce the completion of volume 17 (Cölentéres, Échinodermes) of the Natural History of France. The work is to be complete in 26 volumes: 17 on geology, 5 on botany, and one each on geology, paleontology, mineralogy and technology or application of the natural sciences.

The Robert Clarke Company is apparently kept busy turning out edition upon edition of Prof. Lloyd's Editorhpa. Hardly has the sixth edition been placed upon the market when the seventh is already contemplated. Readers of Etidorhpa may be interested to know that the work is being translated into French.

The Annales de l'Institute colonial of Marseilles will publish toward the end of this month a Flore de la Guadelupe et de la Martinique by R. P. Duss, professor of natural history at the collège de la Banetene (Guadeloupe). Notes with regard to the economic uses of these plants are supplied by Professor Heckel. The volume will contain about 500 or 600 pages.

The Chemical Publishing Company announces the completion of the third edition of each of the following books: Chemistry for Beginners by Edward Hart, Professor of Chemistry at Lafayette College, and Notes on Qualitative Analysis by Prof. M. P. Mason of the Rensselaer Polytechnic Institute.

The first edition of Dr. Jul. Otto's Ausmittelung der Gifte was published in 1856. The first part of the seventh edition, edited by Dr. Robert Otto and published by Friedr. Vieweg & Sohn was ready this spring and comprises the volatile and alkaloidal poisons. The second part comprising the inorganic poisons and the chapter on the recognition of blood stains is to be ready this fall.

The November Popular Science Monthly, No. 1 of vol. 50, contains an interesting and well illustrated article on Public Aquariums in Europe by Bashford Dean of Columbia University. It also contains an editorial explanation of President Jordan's article on the Symphsychograph, which appeared is a recent number of the same journal, and which stirred up many minds. The editor designates it "an almost too successful joke".

The Chemische Rundschau is a new journal published in the interest of the entire chemical industry and edited by Dr. Franz Peters of the Kgl.-Tech. Hochschule zu Charlottenburg.

The jury of the Second International Pharmaceutical Exhibition at Prague has awarded the firm of Wilhelm Braumueller the silver medal for the Handwörterbuch der Pharmacie edited by A. Brestowski.

Julius Springer announces as just out Dr. Max Biechele's Anleitung zur Erkennung, Prüfung und Werthbestimmung der gebräuchlichsten Chemikalien für den technischen und pharmaceutischen Gebrauch.

The very valuable Bericht of Schimmel & Co., which for about five years has also appeared simultaneously as Semi-Annual Report in the English language, will hereafter be translated into French.

Lea Brothers & Co. announce as just ready the fifth edition of Remsen's Theoretical Chemistry. The book is translated into both German and Italian and the new edition has been thoroughly revised by the author.

Professors O. Schrader of Jena and O. Engler of Berlin have edited the sixth edition of Victor Helm's Kulturpflanzen und Hausthiere in ihrem Uebergange von Asien nach Griechenland und Italien sowie das übrige Europa. This is the first edition of the popular historic philologic sketches since the death of the author. Without marring the original text the book has been brought up to the present status of scientific investigations along these lines by notes by the new editors. The book is published by the Gebrueder Borntraeger of Berlin.

A biographical sketch of the famous physiologist Carl Ludwig (see Pharm. Rundsch., vol. 13. p. 144), written by Dr. J. von Kries, Professor of Physiology at the University of Freiburg i. B., has been published by the Akademische Verlagsbuchhandlung of J. C. B. Mohr.

The Pharmaceutical Era, which with this months' issues completes its first decade, will celebrate this fact by the publication of a Tenth Anniversary Number. A number of well-known pharmaceutical writers will contribute to this number, which is advertised as "an encyclopedia of drug trade facts."

The second volume of Our Native Birds of Song and Beauty, by Henry Nehrling, custodian of the Milwaukee Public Museum, is now ready. The first volume has received nothing but the most unstinted praise and lovers of birds will be glad to learn of the completion of the work. It is published by Geo. Brumder of Milwaukee, Wis.

Catalogues received:—

Geo. Brumder—Milwaukee, Wis. Illustrirter Porträt-Katalog der empfehlenswerthesten Bücher der deutschen und englischen Literatur. pp. 140.

Gustav Fock—Leipzig. Lagerverzeichniss No. 117: Chemie und Pharmacie, chemische Technologie, Hygiene, Bakteriologie, Mikroskopie.

Lemcke & Buechner—New York. Monthly Bulletin of World Literature No. 9.

Julius Springer — Berlin. Empfehlenswerthe Werke für Pharmaceuten.

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AMSTERDAM, 1889,
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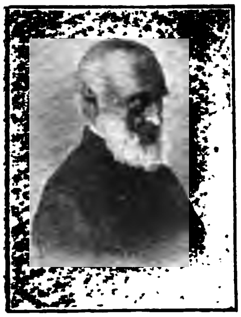

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